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12/31/91

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2/11/93

FINAL DRAFT
SITE INSPECTION REPORT
MERRICK LANDFILL
MERRICK, NASSAU COUNTY, NEW YORK

PREPARED UNDER

WORK ASSIGNMENT NO. 019-2JZZ
CONTRACT NO. 68-W9-0051

DECEMBER 31, 1991

VOLUME 1 OF 2

SUBMITTED BY:

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SITE SUMMARY AND RECOMMENDATIONS

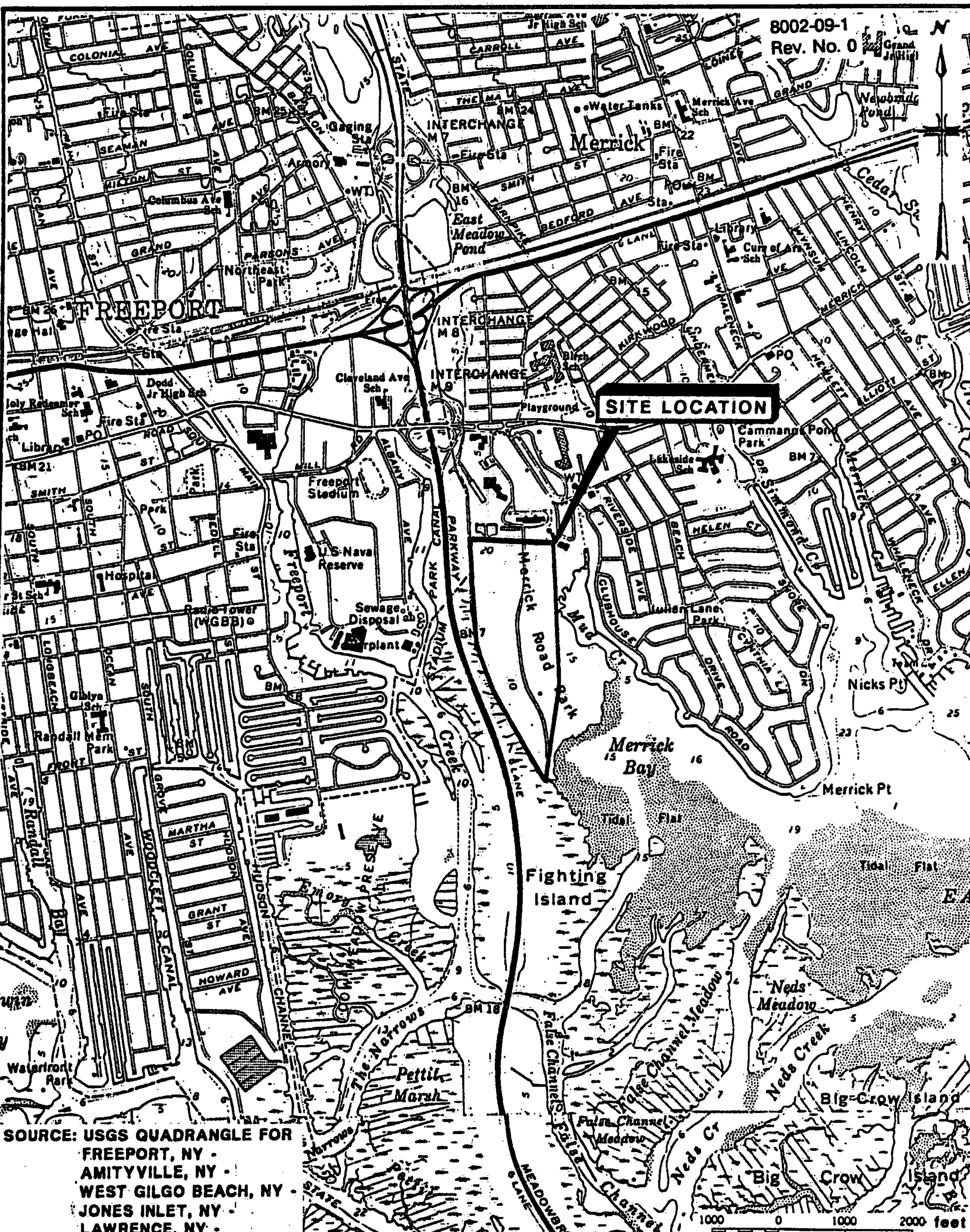
The Merrick Landfill (which operated from 1950 - 1984) is located in Merrick, Nassau County, New York. Figures 1 and 2 provide a Site Location map and Site map, respectively. The site is located on the south side of Merrick in a residential and light commercial section. The entire site property occupies approximately 82 acres, upon which is constructed a landfill, an active refuse transfer station, and the Town of Hempstead/Department of Sanitation offices. The site is generally flat with the exception of the southern landfill portion. Landfill closure was initiated in 1984, under an Order of Consent agreement with the New York State Department of Environmental Conservation (NYSDEC). Background information indicated the wastes accepted were characterized as typical municipal solid waste, with no sewage or industrial sludges, or hazardous/toxic materials having been dumped at the landfill.

In addition to the landfill, an on-site incinerator plant was operated for an unknown period of time until ceasing operation in 1980. The residual ash, derived from municipal waste incineration, was disposed of by deposition into the landfill and ash settling lagoons, located adjacent to the north slope of the landfill. During decommissioning of the incinerator, parts of the plant were removed from the plant building, and the ash settling lagoons were backfilled with sandy soil. The landfill is presently covered with a heavy overgrowth of vegetation and the lagoon area is used as a staging and storage area for the waste hauler conducting operations at the refuse transfer station.

To the south and west of the landfill is the East Hempstead/Merrick Bay and an unnamed tidal inlet and marshlands, respectively. These areas have been classified as significant habitats for New York State endangered and threatened species, in addition to the vast ecological wetland acreage also present. To the east of the facility is Merrick Road Park which is comprised of a public park for recreation use and a golf course (directly adjacent to the landfill).

Phase I and Phase II investigations were performed for the Merrick Landfill Site, in 1985 and 1987, respectively. The results of these investigations led to the delisting (under NYSDEC guidance criteria) of the facility from the NYS Superfund list. Results of the Phase II investigation indicated the presence of organic and inorganic constituents in downgradient monitoring wells, not detected in upgradient wells. In addition, surface water is suspected of potential contamination by these same constituents via the ground water to surface water discharge and those substances detected in sediments collected from the unnamed tidal inlet.

The deposition of sanitary wastes into Merrick Landfill may potentially impact the numerous sensitive environments (i.e., wetlands, habitats for endangered and threatened species, etc.) and a hard clam fishery identified in the adjacent East Hempstead/Merrick Bay complex. The bay area and the Atlantic Ocean is also utilized for recreational purposes. The presence of contaminants in the underlying aquifer is of minor consequence as the likelihood of regional drinking water supply systems being affected is negligible. The probability of direct contact with the wastes deposited in the landfill was minimized by a heavy vegetative cover and restricted access to the landfill portion of the site.



SOURCE: USGS QUADRANGLE FOR
FREEPORT, NY -
AMITYVILLE, NY -
WEST GILGO BEACH, NY -
JONES INLET, NY -
LAWRENCE, NY -
LYNBROOK, NY

MERRICK LANDFILL
MERRICK, NEW YORK

SITE LOCATION MAP

FIGURE 1

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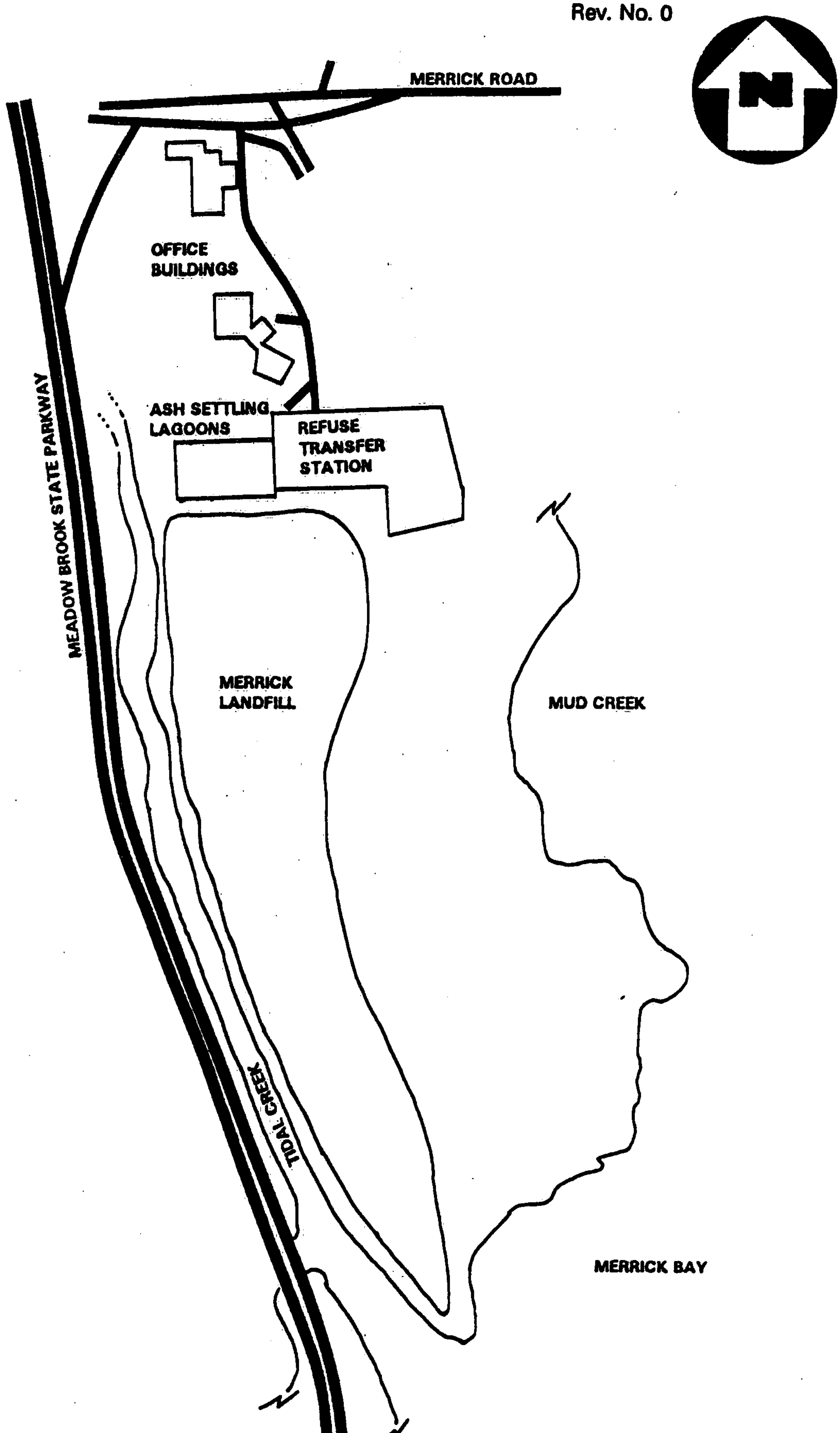


SITE MAP

MERRICK LANDFILL,

MERRICK, N.Y.

SCALE UNKNOWN

FIGURE 2

SITE ASSESSMENT REPORT: SITE INSPECTION

PART I: SITE INFORMATION

1. Site Name/Alias Merrick Landfill / Hempstead Incinerator

   Street 1600 Merrick Road

   City Merrick State New York Zip 11566

2. County Nassau County Code 059 Cong.Dist. 3

3. Site/Alias EPA ID No. NYD 982181018 / NYD 980506752

4. Block No. 231 Lot No. 1 (Group 1 through 5)

5. Latitude 40° 38' 45" N Longitude 73° 33' 48" W

   USGS Quad. Freeport

6. Owner Town of Hempstead Telephone No. (516) 378-4210

   Street Main Street

   City Hempstead State New York Zip 11550

7. Operator Town of Hempstead/Department of Sanitation Telephone No. (516) 378-4210

   Street 1600 Merrick Road

   City Merrick State New York Zip 11556

8. Type of Ownership

   ___ Private ___ Federal ___ State

   ___ County _X_ Municipal ___ Unknown ☐ Other ______

9. Owner/Operator Notification on File

   ___ RCRA 3001 ___ Date ______ ___ CERCLA 103c Date ______

   ___ None _X_ Unknown

10. Permit Information

Permit	Permit No.	Date Issued	Expiration Date	Comments

There are no active permits at the present time.

11. Site Status

_X_ Active __ Inactive

The active status of the site, refers to the municipal refuse transfer station currently operating on-site. The landfill has been inactive since closure in 1984.

12. Years of Operation 1950 to present

13. Identify the types of waste sources (e.g., landfill, surface impoundment, piles, stained soil, above- or below-ground tanks or containers, land treatment, etc.) on site. Initiate as many waste unit numbers as needed to identify all waste sources on site.

(a) Waste Sources

Waste Unit No.	Waste Source Type	Facility Name for Unit
1	Landfill	Landfill
2	Surface Impoundment	Ash-Settling Lagoons

(b) Other Areas of Concern

Identify any miscellaneous spills, dumping, etc. on site; describe the materials and identify their locations on site.

An active municipal refuse transfer station, operated by Browning-Ferris Industries, Inc. (BFI), is located (on-site) to the immediate north of the landfill. Since the closure of the landfill in 1984, the Town of Hempstead contracted BFI to haul approximately 208,000 tons per years of municipal refuse, to a private landfill in Goshen, New York. The area to the north of the landfill will function as a transfer station until an ultimate remedy for the Town of Hempstead's refuse can be determined.

Ref. Nos. 1, 2, 3, pp. 1-3; 9, 25, pp. 6, 7, 9; 26, pp. 8-10, 13-15

14. Information available from

Contact Amy Brochu Agency U.S. EPA Telephone No. (908)906-6802

Preparer Steven T. McNulty Agency Malcolm Pirnie, Inc. Date 12/31/91

PART II: WASTE SOURCE INFORMATION

For each of the waste units identified in Part I, complete the following items.

Waste Unit 1 Landfill

Source Type

X	Landfill		Contaminated Soil
	Surface Impoundment		Pile (Specify type: chemical, junk, trash, tailing, etc.)
	Drums		Land Treatment
	Tanks/Containers		Other (Specify ______)

Description:

The Merrick Landfill is approximately 3,500 feet long, 300 feet wide at the south end, 500 feet wide at the north end, and ranges in height between 0 feet and 125 feet above mean sea level. The landfill was active between the years 1950 to 1984 and accepted a total of 3,800,000 cubic yards of municipal refuse. Based upon past records the following are the percentages of waste materials accepted: residential garbage 78%, rubbish 14.5%, demolition debris (negligible), street sweepings 1.5%, and landscaping 6%. From available records there is no documentation of the dumping of sewage sludge, industrial sludge, hazardous/toxic materials, or any material, other than typical municipal refuse, at the landfill. The landfill underwent closure in 1984, and Phase I and Phase II Investigations (under NYSDEC guidance) were performed in 1985 and 1987, respectively.

The landfill is located on the southern portion of an 82.2 acre property, which is comprised of the following land uses:

- Town of Hempstead offices (northern portion) 21.0 acres
- Active refuse transfer station (middle portion) 18.7 acres (former incinerator and ash-settling lagoon location)
- Landfill site (southern portion) 42.5 acres

During the on-site reconnaissance performed on November 26, 1991 no leachate seeps were observed and a heavy vegetation cover was noted upon the landfill. The facility is completely fenced and/or adjacent to open water, thus access is restricted.

Hazardous Waste Quantity

No hazardous wastes were disposed of at Merrick Landfill.

Hazardous Substances/Physical State

The following constituents have been found at levels above background during monitoring well sampling; chlorobenzene, bis(2-ethyl-hexyl)phthalate, selenium, vanadium, and nickel. Table I in Part III of this report provides a summary of the analytical results of the hazardous substances detected in monitoring well samples.

Ref. Nos. 4, pp. 1-3; 10; 14; 26, pp. 13-15, 95-157

PART II: WASTE SOURCE INFORMATION

For each of the waste units identified in Part I, complete the following items.

Waste Unit 2 - Ash Settling Lagoons

Source Type

______	Landfill	______	Contaminated Soil
X	Surface Impoundment	______	Pile (Specify type: chemical, junk, trash, tailing, etc.)
______	Drums	______	Land Treatment
______	Tanks/Containers	______	Other (Specify ______)

Description:

Three settling lagoons were constructed for the collection of fly ash produced by the incinerator that previously operated on-site. In 1980, when the incinerator ceased operations, the lagoons were backfilled with approximately 8 feet of sandy fill material. The surface area of the lagoons prior to closure is estimated at 4,540 square feet and the depth of ash material was determined to be 10 feet during the Phase II investigation.

During the on-site reconnaissance performed on November 26, 1991 it was noted that former locations of the abandoned ash lagoons are completely buried, thus access is restricted. The area above the former location of the ash lagoons is presently used as a storage area for BFI trailers, used to transport municipal refuse generated from the transfer station.

Hazardous Waste Quantity

The volume of ash material present in the abandoned ash lagoons is estimated at 45,400 cubic feet (or 1681.5 cubic yards).

Hazardous Substances/Physical State

The following inorganic substances were detected in ash and soil samples collected during the Phase II sampling program: arsenic, barium, beryllium, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, tin, vanadium, and zinc. Table II in Part III of this report provides a summary of the analytical results of the hazardous substances detected in ash and soil samples.

Ref. Nos. 4, pp. 1-3; 26, pp. 18-19, 27-28, 175-206

PART III. SAMPLING RESULTS

EXISTING ANALYTICAL DATA

Investigation of groundwater and soil contamination at the Merrick Landfill Site was initiated as part of the Phase II Investigation. Prior to investigation-related sampling, fifteen monitoring wells (seven shallow and eight deep wells) were drilled upgradient, into, and downgradient of the landfill. Locations of monitoring wells (see Figure 3) were selected to characterize the potential groundwater contamination problem and were screened into the Upper Glacial aquifer, the water-bearing formation underlying the site.

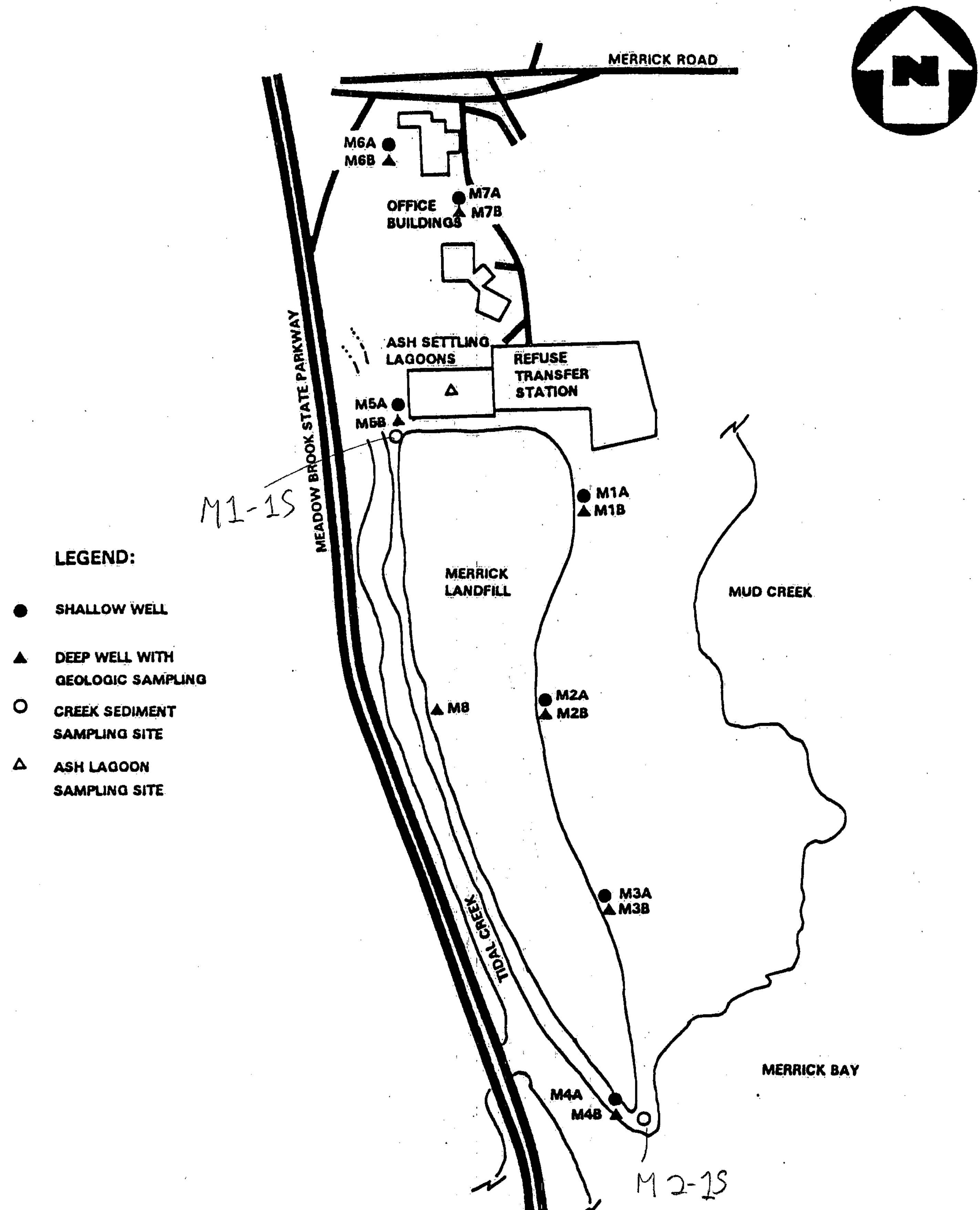
Analytical results of groundwater sampling indicate the presence of organic and inorganic contaminants in downgradient monitoring wells, not detected in updgradient wells. A summary of these results is presented in Table 1.

In addition to groundwater sampling, areas were selected for soil and sediment sampling. Soil sampling occurred in the location of the abandoned ash settling lagoons. The depths of the samples were selected to determine whether the contaminants from deposited fly ash, were leaching into underlying sand beds. Sediment samples were collected along the eastern side of the tidal creek adjacent to the landfill. Location of sediment sample M1-1S was approximately 300 feet west of the ash settling lagoons and was selected to document the potential migration of contaminants from the former ash settling lagoons into the adjacent surface waters. The location of sediment sample M2-1S was at the southern tip of the landfill and was selected to document the possible migration of contaminants from the entire site into the adjacent East Hempstead/Merrick Bay. Analytical results for these sampling activities are summarized in Table 2. The level of QA/QC supporting the analytical results found in the references is unknown.

SITE INSPECTION SAMPLE RESULTS

No sampling was conducted during the Site Inspection.

Ref. Nos. 26, pp. 18-19, 96-206



SAMPLE LOCATION MAP
MERRICK LANDFILL,
MERRICK, N.Y.

SCALE UNKNOWN

FIGURE 3

TABLE 1
ORGANIC AND INORGANIC ANALYSIS OF MONTORING WELL SAMPLING
CONDUCTED ON NOVEMBER 1987 AT THE MERRICK LANDFILL SITE

-----CONSTITUENT-----	--------UPGRADIENT--------				-----DOWNGRADIENT-----											
	M6		M7		M5		M1		M2		M8		M3		M4	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
BIS(2-ETHYLHEXYL)PHTHALATE	---	---	---	---	---	---	---	---	280	---	---	---	---	37	---	---
CHLOROBENZENE	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	18
NICKEL	---	---	---	15	---	---	---	---	---	---	---	57	---	---	---	---
SELENIUM	---	---	---	---	---	14	---	14	---	28	---	17	---	---	---	---
VANADIUM	---	---	---	---	---	---	---	---	---	---	---	---	170	170	80	2200

A - SHALLOW WELL

B - DEEP WELL

J - ESTIMATE VALUE BELOW CONTRACT REQUIRED DETECTION LIMIT

ALL VALUES IN UG/L

Ref. No. 26; pp. 89, 90, 95-157

TABLE 2
INORGANIC ANALYSIS RESULTS OF ASH LAGOON AND CREEK SEDIMENT SAMPLING
CONDUCTED FROM 11/87 TO 1/88 AT THE MERRICK LANDFILL SITE

CONSTITUENT	1,2,3 ASH LAGOON	4,5 ASH LAGOON	6 ASH LAGOON	M1-1S	M2-1S
ALUMINUM	11900	4680	350	1.5	---
ANTIMONY	---	---	5	---	---
ARSENIC	5	5.2	---	---	---
BARIUM	226	162	54	---	---
BERYLIUM	0.07	0.6	0.7	---	---
CADMIUM	13.1	13.3	0.8	---	---
CHROMIUM	21.4	17.7	2.7	---	---
COPPER	128	102	3.5	---	---
IRON	3682	3535	2455	137.8	1.4
LEAD	967	267.8	8.4	---	5
MAGNESIUM	1650	1810	191	34	---
MANGANESE	269	248	27.3	1.4	---
MERCURY	0.32	0.56	0.26	0.46	---
NICKEL	15	11.8	2.8	5	---
SELENIUM	0.5	---	---	---	---
TIN	54200	78300	---	---	---
VANADIUM	0.17	0.16	---	4	---
ZINC	916	753	8.3	5	---

*NOTE 1,2,3 ASH LAGOON SAMPLE IS A COMPOSITE OF SPLIT SPOON SAMPLES COLLECTED FROM 8-15.5 FEET BELOW GRADE.
4,5 ASH LAGOON SAMPLE IS A COMPOSITE OF SPLIT SPOON SAMPLES COLLECTED FROM 15.5-19 FEET BELOW GRADE.
6, ASH LAGOON SAMPLE IS A SPLIT SPOON SAMPLE COLLECTED FROM 19-21 FEET BELOW GRADE.

(-) - NOT DETECTED
ALL VALUES IN MG/KG

REF. NO. 26; PP. 175-206

PART IV. HAZARD ASSESSMENT

GROUNDWATER ROUTE

1. **Describe the likelihood of a release of contaminant(s) to the groundwater as follows: observed release, suspected release, or none. Identify contaminants detected or suspected and provide a rationale for attributing them to the site. For observed release, define the supporting analytical evidence.**

There is a documented release to the Upper Glacial aquifer of organic and inorganic compounds with concentrations increasing downgradient. Two organic constituents were detected in downgradient monitoring well samples, bis (2-ethyl-hexyl) phthalate (280ppb in MW2, and 37ppb in MW3) and chlorobenzene (18ppb in MW4), that were not detected in the upgradient monitoring wells (MW6 and MW7). Two inorganic constituents were detected in downgradient monitoring well samples selenium (14ppb in MW5/MW1, 28ppb in MW2, and 17ppb in MW8), and vanadium (170ppb in MW3, and 2,200ppb in MW4), that were not detected in the upgradient monitoring wells. Additionally, nickel was detected (57ppb in MW8) in a downgradient monitoring well, at a level in excess of normal background/ upgradient concentration levels (15ppb in MW7).

Ref. No. 26, pp. 96-157

2. **Describe the aquifer of concern; include information such as depth, thickness, geologic composition, areas of karst terrain, permeability, overlying strata, confining layers, interconnections, discontinuities, depth to water table, groundwater flow direction.**

The aquifer of concern underlying the site is the Upper Glacial aquifer, which is comprised of beds of fine to coarse sand, and gravel deposited during the upper Pleistocene unit of the Quaternary Age of geological events. The aquifer lies directly upon a bed of marine clay, that provides a confining layer between the aquifer and the underlying Magothy aquifer. The Magothy aquifer is comprised of a mixture of silt, fine to coarse sand, and clay deposits of the Cretaceous Age Magothy Formation unit.

From information gathered during geologic investigations, the site is underlain by a layer of permeable fine to coarse sand and gravel outwash deposits, which comprise the Upper Glacial Aquifer, that extends to a depth of 40 feet. The groundwater within this formation is not only affected by the presence of Merrick Landfill, but also the intrusion of seawater from the adjacent bay. The influence of major seawater cations (Na, Mg, Ca and K) has delegated the classification of the groundwater to a Class of GA (non-potable water source).

At a depth of 40 feet, there is a confining layer of marine clay which is known to extend approximately 1 - 1 1/2 miles north of the landfill site (approximate location of the Sunrise Highway). This clay member protects the underlying Magothy Aquifer Formation from contamination by seawater intrusions and those contaminants being released to the water table aquifer. It is documented that there is a groundwater gradient between aquifers, upward from the Magothy into the Upper Glacial.

The groundwater table beneath the landfill begins at mean sea level. To the north, at the former location of the backfilled ash lagoons, the depth to groundwater is six (6) feet below the surface. Groundwater flow is potentially tidally-influenced, that during a hightide the regional flow direction to the south may reverse to the north.

Ref. Nos. 3; 24, pp. 7-9; 25, pp. 62-63; 26, pp. 16-18, 39, 90

3. **Is a designated wellhead protection area within 4 miles of the site?**

The site is located approximately 2.5 miles southeast from a wellhead protection area.

Ref. Nos. 13, pg. 18; 20

4. **What is the depth from the lowest point of waste disposal/storage to the highest seasonal level of the saturated zone of the aquifer of concern?**

In both the landfill and the backfilled ash settling lagoons, wastes are in direct contact with the highest seasonal level of the saturated zone of the Upper Glacial aquifer.

Ref. No. 26, pg. 90

5. **What is the permeability value of the least permeable continuous intervening stratum between the ground surface and the aquifer of concern?**

No continuous intervening stratum lie between the ground surface and the aquifer of concern.

Ref. No. 26, pg. 90

6. **What is the distance to and depth of the nearest well that is currently used for drinking purposes?**

There are no wells currently drawing water from the Upper Glacial aquifer within a four mile distance of the site.

Ref. Nos. 5; 16; 17; 18; 19; 20; 23

7. **If a release to groundwater is observed or suspected, determine the number of people that obtain drinking water from wells that are documented or suspected to be located within the contamination boundary of the release.**

There are no drinking water wells within the contamination boundary of the observed release to the groundwater.

Ref. Nos. 5; 6; 17; 18; 19; 20

8. **Identify the population served by wells located within 4 miles of the site that draw from the aquifer of concern.**

Wells tapping the Magothy aquifer within 4 miles were excluded from evaluation due to the presence of the 20-foot marine clay layer beneath the site, coupled with regional groundwater flow direction to the south, that reduces the potential for substances to migrate north to potable water wells identified.

Distance	Population
0 - 1/4 mile	0
> 1/4 - 1/2 mile	0
> 1/2 - 1 mile	0
> 1 - 2 miles	0
> 2 - 3 miles	23,400
> 3 - 4 miles	0

State whether groundwater is blended with surface water or with groundwater from other wells.

Also provide an explanation on how each ring population was determined.

Fifteen standby drinking water wells, owned and operated by the Long Island Water Corporation, are located in a wellfield on Seaman Avenue, Baldwin, New York. The wells when in operation draw water from the Upper Glacial aquifer and are part of a blended system that distributes water to approximately 234,000 people. The wellfield is located approximately 2.75 miles to the northeast. The number of persons apportioned to the wellfield is 23,400.

Ref. Nos. 5; 16; 17; 18; 19; 20; 23

9. **Identify uses of groundwater within 4 miles of the site (i.e. private drinking source, municipal source, commercial, irrigation, unusable).**

Within 4 miles of the site, groundwater obtained from wells is used for public drinking water supply, private drinking water supply, commercial water supply, irrigation purposes, and in the immediate area (1/2 -1 mile radius) of Merrick Landfill, the groundwater is classified as non-potable water source.

Ref. Nos. 5; 16; 17; 18; 19; 20; 26, pg. 47

SURFACE WATER ROUTE

10. **Describe the likelihood of a release of contaminant(s) to surface water as follows: observed release, suspected release, or none. Identify contaminants detected or suspected and provide a rationale for attributing them to the site. For observed release, define the supporting analytical evidence.**

In both the landfill and the backfilled ash settling lagoons, wastes are in direct contact with the highest seasonal level of the saturated zone of the Upper Glacial aquifer. There is an observed release to groundwater, which is hydraulically connected to/and influenced by seawater. Therefore, contaminants listed (in Question 1 - Groundwater Route) previously, would be available for transport to adjacent surface waters (tidal creek and Merrick Bay) via the groundwater to surface water discharge.

Ref. No. 26, pp. 96-157

11. **Identify the nearest downslope surface water. If possible, include a description of possible surface drainage patterns from the site.**

To the west the landfill is adjacent to an unnamed tidal creek, and to the south the landfill is adjacent to East Hempstead/Merrick Bay.

Ref. No. 6

12. **What is the distance to the nearest downslope surface water? Measure the distance along a course that runoff can be expected to follow.**

The site is adjacent to the nearest surface water.

Ref. No. 6

13. **Determine the type of floodplain.**

The site is located within the 100-year floodplain.

Ref. No. 7

14. **Identify drinking water intakes in surface waters within 15 miles downstream of the site. For each intake identify the distance from the point of surface water entry, population served, and stream flow at the intake location.**

There are no drinking water intakes in surface waters within 15 miles downstream of the site.

Ref. Nos. 6; 12

15. **Identify fisheries that exist within 15 miles downstream of the point of surface water entry. For each fishery specify the following information:**

Fishery Name	Water Body Type	Flow (cfs)	Saline/Fresh/Brackish
Hard Clam	Bay	N/A	Saline/Brackish

Ref. No. 21

16. **Identify sensitive environments that exist within 15 miles of the point of surface water entry. For each sensitive environment specify the following:**

Sensitive Environment	Water Body Type	Flow (cfs)	Frontage (miles)
Significant habitat for coastal fish and wildlife. (New York State threatened and endangered species).	East Hempstead/ Merrick Bay	N/A	
Significant habitat for coastal fish and wildlife. (New York State threatened and endangered species).	Short Beach/ Jones Beach State Park	N/A	

Sensitive Environment	Water Body Type	Flow (cfs)	Frontage(miles)
Significant habitat for coastal fish and wildlife. (New York State threatened and endangered species).	Nassau Beach/Atlantic Ocean	N/A	
Significant habitat for coastal fish and wildlife. (New York State threatened and endangered species).	Storehouse/Jones Beach/ Atlantic Ocean	N/A	
Significant habitat for coastal fish and wildlife. (New York State threatened and endangered species).	West End Jones Beach Atlantic Ocean	N/A	
Significant habitat for coastal fish and wildlife. (New York State threatened and endangered species).	Middle Hempstead Bay	N/A	
Wetlands	Coastal and Tidal Wetlands in East Hempstead/ Merrick Bay	N/A	>20 miles

Ref. Nos. 8; 22

17. **If a release to surface water is observed or suspected, identify any intakes, fisheries, and sensitive environments from question Nos. 16-18 that are or may be located within the contamination boundary of the release.**

Intake: There are no drinking water intakes in surface waters within 15 miles downstream of the site.

Fishery: The are no fisheries located within the contamination boundary of the suspected release to surface water.

Sensitive Environment: East Hempstead/Merrick Bay is within the contamination boundary of the suspected release to surface water.

Ref. Nos. 8; 21; 22, pp. 2-5

SOIL EXPOSURE PATHWAY

18. **Determine the number of people that occupy residences or attend school or day care on or within 200 feet of the site property.**

There are no residences, schools, or day care centers within 200 feet off the site property.

Ref. Nos. 9; 10

19. Determine the number of people that work on or within 200 feet of the site property.

There are 20 people who work on the site property. They perform all the duties associated with operating a municipal refuse transfer station.

Ref. No. 10

20. Identify terrestrial sensitive environments on or within 200 feet of the site property.

Adjacent to the landfill is the East Hempstead/Merrick Bay. The bay and its surrounding salt marshes, tidal flats, dredge spoil islands, and open water is classified as a significant habitat for coastal fish and wildlife. New York State threatened wildlife species (Common Terns and Northern Harriers) have in the past nested in the immediate bay area. In addition to wildlife, the entire southern and westerns slopes of the landfill is adjacent to approximately 10 acres of coastal wetlands and tidal marshes.

Ref. Nos. 8; 22, pp. 2-5

AIR ROUTE

21. Describe the likelihood of release of contaminants to air as follows: observed release, suspected release, or none. Identify contaminants detected or suspected and provide a rationale for attributing them to the site. For observed release define the supporting analytical evidence.

No air readings above background were detected in the ambient air during an on-site reconnaissance on November 26, 1991. During the Phase II Investigation field sampling episode, no air readings were detected above background prior to the disturbance of soils, for the collection of samples. Therefore, no suspected release to the air is identified for the landfill, which is heavily vegetated.

Ref. Nos. 14; 26, pp. 21-22

22. Determine populations that reside within 4 miles of the site.

Distance	Population
0 - 1/4 mile	0
>1/4 - 1/2 mile	3,029
>1/2 - 1 mile	10,450
>1 - 2 miles	47,428
>2 - 3 miles	74,177
>3 - 4 miles	93,691
Total Population	228,775

Ref. No. 15

23. Identify sensitive environments and wetlands acreage within 1/2 mile of site.

0 - 1/4 mile Sensitive Environments/Wetland Acreage	1/4 - 1/2 mile Sensitive Environments/Wetland Acreage
Adjacent significant habitat for coastal fish and wildlife present in the East Hempstead/Merrick Bay.	Adjacent significant habitat for coastal fish and wildlife present in the East Hempstead/Merrick Bay.
6 acres of environmentally sensitive wetlands and tidal marshes.	82 acres of environmentally sensitive wetlands and tidal marshes.

Ref. Nos. 8; 22, pp. 2-5

24. If a release to air is observed or suspected, determine the number of people that reside or are suspected to reside within the area of air contamination from the release.4

There is no suspected release to the air at the Merrick Landfill site.

Ref. Nos. 14; 26, pp. 21-22

25. If a release to air is observed or suspected, identify any sensitive environments, listed in question No. 23, that are or may be located within the area of air contamination from the release.

There is no suspected release to the air at the Merrick Landfill site.

Ref. Nos. 14; 26, pp. 21-22

ATTACHMENT 1

EXHIBIT A

PHOTOGRAPH LOG

MERRICK LANDFILL
MERRICK, NASSAU COUNTY, NEW YORK

ON-SITE RECONNAISSANCE: NOVEMBER 26, 1991

PHOTOGRAPH INDEX

MERRICK LANDFILL
MERRICK, NEW YORK
NOVEMBER 26, 1991

ALL PHOTOGRAPHS TAKEN BY STEVEN MCNULTY

Photo No.	Description	Time
1R-P1	View facing northwest of municipal refuse piles, located adjacent to the backfilled ash settling lagoons.	0852
1R-P2	View facing west of the backfilled ash settling lagoons.	0855
1R-P3	View facing west of the unnamed tidal creek, located adjacent to the backfilled ash settling lagoons.	0902
1R-P4	View facing south of the north slope of Merrick Landfill.	0902
1R-P5	View facing north of the top of the landfill.	0910
1R-P6	View facing southeast of the golf course, located adjacent to the eastern slope of the landfill.	0912
1R-P7	View facing north of the top of the landfill.	0915
1R-P8	View facing north of the Town of Hempstead's office complex and the BFI municipal refuse transfer station.	0916
1R-P9	View facing west of commercial/manufacturing and residential area, located across the Meadowbrook State Parkway.	0918
1R-P10	Second half (right half) of print 1R-P9.	0922
1R-P11	View facing north of the former incinerator complex (active refuse transfer station).	0930
1R-P12	View facing south of East Hempstead/Merrick Bay.	0932

Photo No.	Description	Time
1R-P13	View facing south of The Narrows, located across the Meadowbrook State Parkway.	0933
1R-P14	View facing north of the southern slope of the landfill.	0940
1R-P15	View facing west of the unnamed tidal creek adjacent to the landfill (east slope).	0943
1R-P16	View facing south of East Hempstead/Merrick Bay wetlands, adjacent to the southern slope of the landfill.	0945
1R-P17	View facing north of the western slope of the landfill.	0946
1R-P18	View facing north of the eastern slope of the landfill.	0948
1R-P19	View facing north of the eastern slope of the landfill.	0948

1R-P1 November 26, 1991 0852
View facing northwest of municipal refuse piles, located adjacent to the backfilled ash settling lagoons.

1R-P2 November 26, 1991 0855
View facing west of the backfilled ash settling lagoons.

1R-P3 November 26, 1991 0902
View facing west of the unnamed tidal creek, located adjacent to the backfilled ash settling lagoons.

1R-P4 November 26, 1991 0902
View facing south of the north slope of Merrick Landfill.

1R-P5 November 26, 1991 0910
View facing north of the top of the landfill.

1R-P6 November 26, 1991 0912
View facing southeast of the golf course, located adjacent to the eastern slope of the landfill.

1R-P7 November 26, 1991 0915
View facing north of the top of the landfill.

1R-P8 November 26, 1991 0916
View facing north of the Town of Hempstead's office complex and the BFI municipal refuse transfer station.

1R-P9 November 26, 1991 0918
View facing west of commercial/manufacturing and residential area, located across the Meadowbrook State Parkway.

1R-P10 November 26, 1991 0922
Second half (right half) of print 1R-P9.

1R-P11 November 26, 1991 0930
View facing north of the former incinerator complex (active refuse transfer station).

1R-P12 November 26, 1991 Time 0932
View facing south of East Hempstead/Merrick Bay.

1R-P13 November 26, 1991 0933
View facing south of The Narrows, located across the Meadowbrook State Parkway.

1R-P14 November 26, 1991 0940
View facing north of the southern slope of the landfill.

1R-P15 November 26, 1991 0943
View facing west of the unnamed tidal creek adjacent to the landfill (east slope).

1R-P16 November 26, 1991 0945
View facing south of East Hempstead/Merrick Bay wetlands, adjacent to the southern slope of the landfill.

1R-P17 November 26, 1991 0946
View facing north of the western slope of the landfill.

1R-P18 November 26, 1991 0948
View facing north of the eastern slope of the landfill.

1R-P19 November 26, 1991 0948
View facing north of the eastern slope of the landfill.

ATTACHMENT 2

REFERENCES

1. U.S. EPA Superfund Program, Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS). List 8: Site/Event Listing, p. 397, May 1, 1992. List 4: Site Alias Location Listing, pp. 434-435, May 1, 1992.

2. Congressional District, Election Division, New York Department of State.

3. Federal Register, 40 CFR Part 300, Hazard Ranking System; Final Rule, December 14, 1990.

4. U.S. EPA, Potential Hazardous Waste Site, Preliminary Assessment of the Merrick Landfill/Disposal Plant Site, Prepared by U.S. EPA, Environmental Services Division, September 3, 1986.

5. Four Mile Radius Map for the Merrick Landfill Site based on USGS Topographic Maps, 7.5 Minute Series, Quadrangles of "Freeport, NY", "Amityville, NY", "West Gilgo Beach, NY", "Jones Inlet, NY", "Lawrence, NY", and "Lynnbrook, NY".

6. Fifteen-Mile Surface Water Pathway Map for the Merrick Landfill Site based on USGS Topographic Maps, 7.5 Minute Series, Quadrangles of "Freeport, NY" and "Jones Inlet, NY".

7. Flood Insurance Rate Map, Community Panel Map Number 360 467-0056-B, Town of Hempstead, New York, Nassau County, Federal Emergency Management Agency, March 4, 1985.

8. Fifteen-Mile Surface Water Pathway Map for the Merrick Landfill Site based on U.S. Department of Interior, Fish and Wildlife Service, National Wetlands Inventory Maps, New York, Quadrangles of "Freeport, NY" and "Jones Inlet, NY".

9. Telecon Note: Conversation between Lynn, Nassau County Tax Assessment Office, and Steven McNulty, Malcolm Pirnie Incorporated (MPI), August 29, 1991. Nassau County Land and Tax Map, September 10, 1991.

10. Telecon Note: Conversation between Richard Ronan, Town of Hempstead/Department of Sanitation, and Steven McNulty, MPI, December 6, 1991.

11. Telecon Note: Conversation between Lorie Lutzker, Nassau County Health Department, and Steven McNulty, MPI, October 15, 1991.

12. Telecon Note: Conversation between Paul George, NYSDEC-Stony Brook, NY, and Steven McNulty, MPI, December 9, 1991.

13. New York State Wellhead Protection Program, prepared by the New York State Department of Environmental Conservation for the United States Environmental Protection Agency, September, 1990.

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15. General Sciences Corporation, Graphical Exposure Modeling Systems (GEMS). Landover, Maryland, 1986.

16. Letter from Peter Yatsyla, Nassau County Health Department, to Steven T. McNulty, MPI. Subject: Private Well Information.

17. Letter from Carl A. Edstrom, District Manager and Chief Engineer, New York Water Service Corporation, to Steven McNulty, MPI. Subject: Drinking Water Well Information.

18. Letter from Karl W. Dahlem, Chief of Operations, Village of Rockville Centre, Dept. of Water to Steven McNulty, MPI. Subject: Drinking Water Well Information.

19. Information from John L. Bryck, Supervisor Water and Sewer Services, Department of Public Works, Village of Freeport, to Steven McNulty, MPI. Subject: Drinking Water Well Information.

20. Letter from Thomas V. Whiteside, Jr., P.E., Vice President and Manager-Production, Long Island Water Corporation, to Steven McNulty, MPI. Subject: Drinking Water Well Information. Telecon Note: Conversation between Thomas V. Whiteside, Jr., P.E, and Steven McNulty, MPI, January 22, 1993.

21. Project Note: Table "New York-Shellfish Production", National Marine Fisheries Service, 1990.

22. Letter from Michael Corey, Senior Environmental Analyst, Department of State, State of New York to Steven McNulty, MPI. Subject: Sensitive Environments Along the Southern Coast of Long Island.

23. O.L. Frank and N.E. McClymonds, Summary of Hydrologic Situation on Long Island, New York, as a Guide to Water - Management Alternatives. United States Government Printing Office, Washington D.C., 1972.

24. Hydrogeologic Conditions, Merrick and Oceanside Solid Waste Disposal Sites, Town of Hempstead, New York. Geraghty and Miller Incorporated, Syosset, New York.

25. Phase I Investigation, Merrick Landfill. Prepared for the NYSDEC. Prepared by Woodward - Clyde Consultants, Inc., December 1985.

26. Phase II Investigation, Merrick Landfill. Prepared for the Town of Hempstead/Department of Sanitation. Prepared by Charles R. Velzy Associates, Inc., December 1987.

REFERENCE NO. 1

SELECTION:
SEQUENCE: REGION, STATE, SITE NAME

EVENTS: ALL

EPA_ID_NO.	SITE NAME / STREET / CITY / COUNTY_CODE_AND_NAME	STATE ZIP / CONG_DIST.	OPRBLE UNIT	EVENT TYPE	EVENT QUAL	ACTUAL START DATE	ACTUAL COMPL DATE	CURRENT EVENT LEAD
NYD932181018	MERRICK LANDFILL		00	DS1			02/24/87	STATE(FUND)
	1600 MERRICK ROAD			PA1	LOWER PRIORITY		03/03/87	STATE(FUND)
	MERRICK	NY 11566						
	059 NASSAU	NY-04						
NYD932531402	MERRICK RD		00	RV1	CLEAN-UP	03/04/88	09/20/91	EPA (FUND)
	BOUNDED BY WILLIAM FLOYD PKWY,							
	SHIRLEY	NY 11967						
	103 SUFFOLK	NY-01						
NYD980778435	METRO NORTH COMMUTER RAILROAD DPSL SITE		00	DS1			09/01/84	EPA (FUND)
	RAILROAD EASEMENT			PA1	LOWER PRIORITY		09/01/84	EPA (FUND)
	GARRISON TO BEACON	NY 12508		SI2	HIGHER PRIORITY	04/01/85	04/30/85	EPA (FUND)
	027 DUTCHESS	NY-21						
NYD045337945	MICA PRODUCTS		00	DS1			04/01/80	EPA (FUND)
	RTE 22			PA1	NO FURTHER REMOL ACT PLND		09/15/87	STATE(FUND)
	DOVER	NY 12522		SI1	LOWER PRIORITY		04/01/91	STATE(FUND)
	027 DUTCHESS	NY-25						
NYD985913275	MICHEAL WOLFER		00	DS1			03/26/90	STATE(FUND)
	11639 GROVE STREET EXTENSION			PA1	NO FURTHER REMOL ACT PLND	03/29/90	09/19/90	STATE(FUND)
	DELEVAN	NY 14042						
	009 CATTARAUGUS	NY-31						
NYD044470680	MICROWAVE POWER		00	DS1			02/28/89	EPA (FUND)
	330 OSER AVE.			PA1	DEFERRED TO RCRA OR NRC	02/28/89	03/31/89	EPA (FUND)
	HAUPPAUGE	NY 11788						
	103 SUFFOLK	NY-02						
NYD93[illegible]593362	MID ISLAND MAINTENANCE CENTER		00	DS1			02/01/89	EPA (FUND)
	484 RANDALL RD			PA1	DEFERRED TO RCRA OR NRC	02/28/89	03/31/89	EPA (FUND)
	RIDGE	NY 11961						
	103 SUFFOLK	NY-01						

CERCLIS DATA BASE TIME: 15:49:27 U.S. EPA SUPERFUND PROGRAM VERSION 2.00
LEVEL: REGION 02 ** C E R C L I S ** RUN DATE: 05/04/92
SELECTION: INTEGRATED LIST-4: SITE ALIAS LOCATION LISTING RUN TIME: 11:44:37

SEQUENCE: REG, ST, SITE NAME
REGION: 02

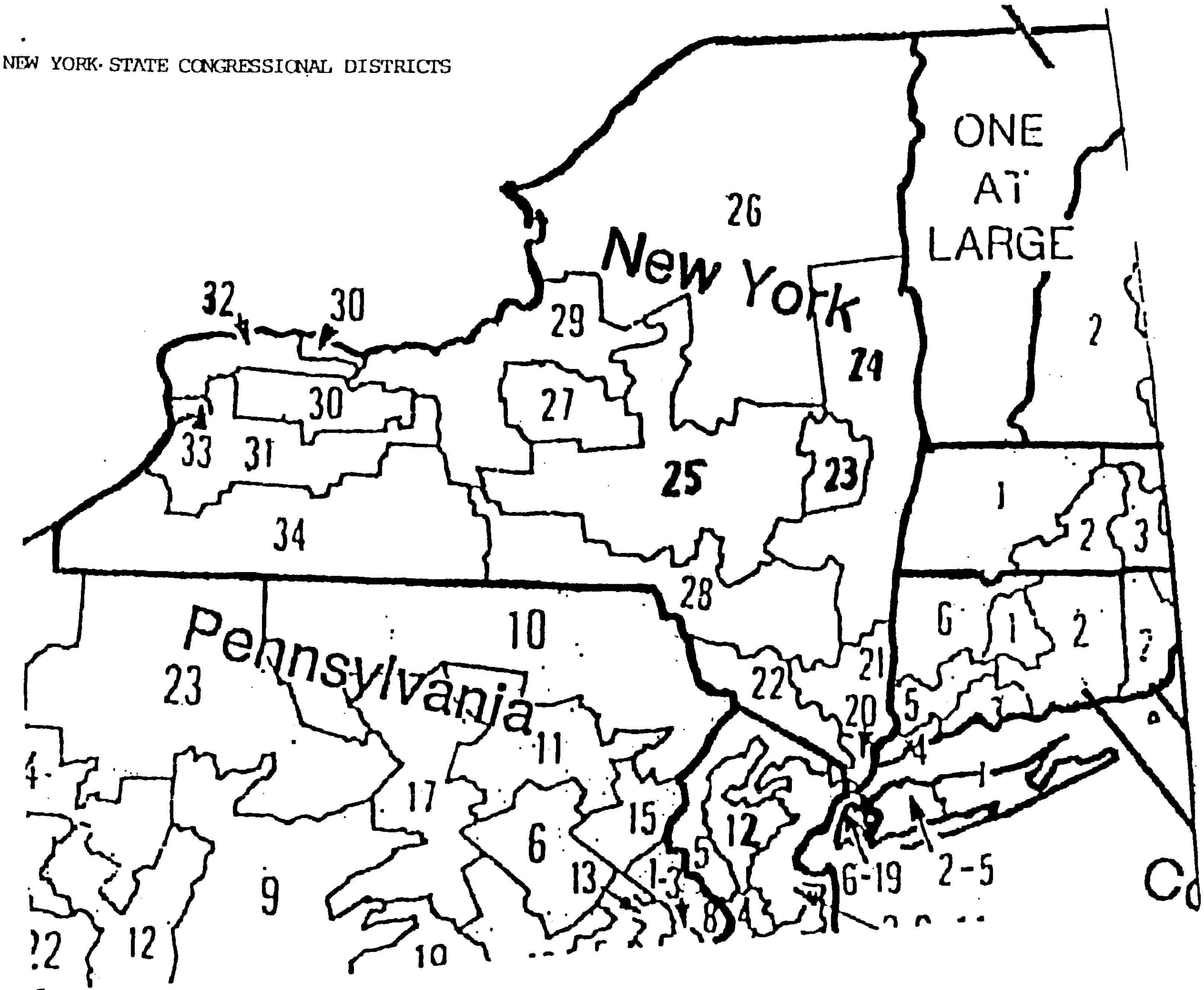
EPA ID	SITE/ALIAS NAME / STREET / CITY / COUNTY NAME	STATE / COUNTY	ZIP CODE	ALIAS SEQ. #	NAME SOURCE	FED FAC	CONG DIST.
NYD980762686	MENDON TOWNSHIP LF				EPA	N	NY-34
	SEMMEL RD						
	HONEOYE FALLS	NY	14472				
	MONROE	055					
NYD980536247	MERCURY AIRCRAFT					N	NY-34
	PERRY POINT RD						
	DRESDEN	NY	14840				
	STEUBEN	101					
	MERCURY AIRCRAFT			01			
	YATES	NY					
NYD048148175	MERCURY REFINING, INC.				EPA	N	NY-23
	RAILROAD AVE						
	COLONIE	NY	12212				
	ALBANY	001					
NYD056022833	MERGENTHALER LINOTYPE				STS	N	NY-03
	MERGENTHALER DR						
	PLAINVIEW	NY	11803				
	NASSAU	059					
	MERGENTHALER LINOTYPE			01			
	NASSAU	NY					
NYD077395106	MERGENTHALER LINOTYPE, MELVILLE FACILITY				EPA	N	NY-02
	201 OLD COUNTRY RD.						
	MELVILLE	NY	11747				
	SUFFOLK	103					
	MERGENTHALER LINOTYPE, MELVILLE FACILITY			01			
	SUFFOLK	NY					
NYD982181018	MERRICK LANDFILL				EPA	N	NY-04
	1600 MERRICK ROAD						
	MERRICK	NY	11566				
	NASSAU	059					

SEQUENCE: REG, ST, SITE NAME
REGION: 02

EPA_ID	SITE/ALIAS NAME / STREET / CITY / COUNTY_NAME	STATE / COUNTY	ZIP CODE	ALIAS SEQ. #	NAME SOURCE	FED FAC	CONG DIST.
NYD982181018 (CONTINUED)	HEMPSTEAD INCINERATOR (NYD980506752) UNKNOWN LOFF	NY	11520	01			
				02			
				03			
NYD982531407	MERRICK RD BOUNDED BY WILLIAM FLOYD PKWY, SHIRLEY SUFFOLK	NY 103	11967			D	NY-01
NYD980778435	METRO NORTH COMMUTER RAILROAD DPSL SITE RAILROAD EASEMENT GARRISON TO BEACON DUTCHESS	NY 027	12508		EPA	N	NY-21
NYD046337945	MICA PRODUCTS RTE 22 DOVER DUTCHESS	NY 027	12522		STS	N	NY-25
NYD986913275	MICHEAL WOLFER 11639 GROVE, STREET EXTENSION DELEVAN CATTARAUGUS	NY 009	14042			N	NY-31
NYD044473680	MICROWAVE POWER 330 OSER AVE. HAUPPAUGE SUFFOLK	NY 103	11788			D	NY-02
	MICROWAVE POWER SUFFOLK	NY		01			

REFERENCE NO. 2

NEW YORK STATE CONGRESSIONAL DISTRICTS



NEW YORK

Congressional District Identification

Table 2. COUNTIES

County	Congressional district
ALBANY	.23
ALLEGANY	.34
BRONX	3,17-19
BROOME	.28
CATTARAUGUS	31,34
CAYUGA	.29
CHAUTAUQUA	.34
CHEMUNG	.34
CHENANGO	.25
CLINTON	.26
COLUMBIA	.24
CORTLAND	.25
DELAWARE	25,28
DUTCHESS	21,24
ERIE	31-33
ESSEX	.26
FRANKLIN	.26
FULTON	.26
GENESEE	.30
GREENE	.24
HAMILTON	.26
HERKIMER	.26
JEFFERSON	.26
KINGS	10-14
LEWIS	.26
LIVINGSTON	30,31
MADISON	25,27
MONROE	29,30,32
MONTGOMERY	23,25
NASSAU	3-5,8
NEW YORK	15-17
NIAGARA	.32
ONEIDA	25,29
ONONDAGA	.27
ONTARIO	30,31
ORANGE	21,22
ORLEANS	.32
OSWEGO	.29
OTSEGO	.25
PUTNAM	.21
QUEENS	6-9
RENSSELAER	23,24
RICHMOND	[illegible]
ROCKLAND	[illegible]
ST. LAWRENCE	[illegible]
SARATOGA	[illegible]
SCHENECTADY	[illegible]
SCHOHARIE	[illegible]
SCHUYLER	.34
SENECA	[illegible]
STEUBEN	[illegible]
SUFFOLK	[illegible]
SULLIVAN	[illegible]
TIOGA	[illegible]
TOMPKINS	[illegible]
ULSTER	[illegible]
WARREN	.24
WASHINGTON	.24
WAYNE	.29
WESTCHESTER	17-22
WYOMING	[illegible]
YATES	[illegible]

Table 3. DISTRICTS AND COUNTIES

CONGRESSIONAL DISTRICT 1

SUFFOLK - PART

CONGRESSIONAL DISTRICT 2

SUFFOLK - PART

CONGRESSIONAL DISTRICT 3

NASSAU - PART
SUFFOLK - PART

CONGRESSIONAL DISTRICT 4

NASSAU - PART

CONGRESSIONAL DISTRICT 5

NASSAU - PART

CONGRESSIONAL DISTRICT 6

QUEENS - PART

CONGRESSIONAL DISTRICT 7

QUEENS - PART

CONGRESSIONAL DISTRICT 8

BRONX - PART
NASSAU - PART
QUEENS - PART

CONGRESSIONAL DISTRICT 9

QUEENS - PART

CONGRESSIONAL DISTRICT 10

KINGS - PART

CONGRESSIONAL DISTRICT 11

KINGS - PART

CONGRESSIONAL DISTRICT 12

KINGS - PART

CONGRESSIONAL DISTRICT 13

KINGS - PART

CONGRESSIONAL DISTRICT 14

KINGS - PART
RICHMOND

CONGRESSIONAL DISTRICT 15

NEW YORK - PART

CONGRESSIONAL DISTRICT 16

NEW YORK - PART

CONGRESSIONAL DISTRICT 17

BRONX - PART
NEW YORK - PART

CONGRESSIONAL DISTRICT 18

BRONX - PART

CONGRESSIONAL DISTRICT 19

BRONX - PART
WESTCHESTER - PART

CONGRESSIONAL DISTRICT 20

WESTCHESTER - PART

CONGRESSIONAL DISTRICT 21

DUTCHESS - PART
ORANGE - PART
PUTNAM
WESTCHESTER - PART

CONGRESSIONAL DISTRICT 22

ORANGE - PART
ROCKLAND
SULLIVAN - PART
WESTCHESTER - PART

CONGRESSIONAL DISTRICT 23

ALBANY
MONTGOMERY - PART
RENSSELAER - PART
SCHENECTADY

CONGRESSIONAL DISTRICT 24

COLUMBIA
DUTCHESS - PART
GREENE
RENSSELAER - PART
SARATOGA
WARREN
WASHINGTON

CONGRESSIONAL DISTRICT 25

CHENANGO
CORTLAND
DELAWARE - PART
MADISON - PART
MONTGOMERY - PART
ONEIDA - PART
OTSEGO
SCHOHARIE
TOMPKINS - PART

CONGRESSIONAL DISTRICT 26

CLINTON
ESSEX
FRANKLIN
FULTON
HAMILTON
HERKIMER
JEFFERSON
LEWIS
ST. LAWRENCE

CONGRESSIONAL DISTRICT 27

MADISON - PART
ONONDAGA

CONGRESSIONAL DISTRICT 28

BROOME
DELAWARE - PART
SULLIVAN - PART
TIOGA
TOMPKINS - PART
ULSTER

CONGRESSIONAL DISTRICT 29

CAYUGA
MONROE - PART
ONEIDA - PART
~~OSWEGO~~
SENECA
WAYNE

CONGRESSIONAL DISTRICT 30

GENESEE
LIVINGSTON - PART
MONROE - PART
ONTARIO - PART

CONGRESSIONAL DISTRICT 31

CATTARAUGUS - PART
ERIE - PART
LIVINGSTON - PART
ONTARIO - PART
WYOMING

CONGRESSIONAL DISTRICT 32

ERIE - PART
MONROE - PART
NIAGARA
ORLEANS

CONGRESSIONAL DISTRICT 33

ERIE - PART

CONGRESSIONAL DISTRICT 34

ALLEGANY
CATTARAUGUS - PART
CHAUTAUQUA
CHEMUNG
SCHUYLER
STEUBEN
TOMPKINS - PART
YATES

NEW YORK

Congressional District Identification—Continued

Table 1. MUNICIPALITIES—Continued

Municipality	County	Congressional district
EAST HILLS VILLAGE	NASSAU	3
EAST RANDOLPH VILLAGE	CATTARAUGUS	34
EAST ROCHESTER VILLAGE	MONROE	30
EAST ROCKAWAY VILLAGE	NASSAU	4
EAST SYRACUSE VILLAGE	ONONDAGA	27
EAST WILLISTON VILLAGE	NASSAU	3
EDWARDS VILLAGE	ST. LAWRENCE	26
ELBA VILLAGE	GENESEE	30
ELBRIDGE VILLAGE	ONONDAGA	27
ELIZABETHTOWN VILLAGE	ESSEX	26
ELLENVILLE VILLAGE	ULSTER	28
ELLICOTTVILLE VILLAGE	CATTARAUGUS	34
ELLISBURG VILLAGE	JEFFERSON	26
ELMIRA CITY	CHEMUNG	34
ELMIRA HEIGHTS VILLAGE	CHEMUNG	34
ELMSFORD VILLAGE	WESTCHESTER	22
ENDICOTT VILLAGE	BROOME	28
ESPERANCE VILLAGE	SCHOHARIE	25
EVANS MILLS VILLAGE	JEFFERSON	26
FABIUS VILLAGE	ONONDAGA	27
FAIR HAVEN VILLAGE	CAYUGA	29
FAIRPORT VILLAGE	MONROE	30
FALCONER VILLAGE	CHAUTAUQUA	34
FARMINGDALE VILLAGE	NASSAU	4
FARNHAM VILLAGE	ERIE	31
FAYETTEVILLE VILLAGE	ONONDAGA	27
[illegible]	ALLEGANY	34
FISHKILL VILLAGE	DUTCHESS	21
FLEISCHMANNS VILLAGE	DELAWARE	25
FLORAL PARK VILLAGE	NASSAU	3,5
FLORIDA VILLAGE	ORANGE	22
FLOWER HILL VILLAGE	NASSAU	3
FONDA VILLAGE	MONTGOMERY	25
FORESTVILLE VILLAGE	CHAUTAUQUA	34
FORT ANN VILLAGE	WASHINGTON	24
FORT EDWARD VILLAGE	WASHINGTON	24
FORT JOHNSON VILLAGE	MONTGOMERY	25
FORT PLAIN VILLAGE	MONTGOMERY	25
FRANKFORT VILLAGE	HERKIMER	26
FRANKLIN VILLAGE	DELAWARE	25
FRANKLINVILLE VILLAGE	CATTARAUGUS	34
FREDONIA VILLAGE	CHAUTAUQUA	34
FREEPORT VILLAGE	NASSAU	4,5
FREEVILLE VILLAGE	TOMPKINS	25
FULTON CITY	OSWEGO	29
FULTONVILLE VILLAGE	MONTGOMERY	25
GAINESVILLE VILLAGE	WYOMING	31
GALWAY VILLAGE	SARATOGA	24
GARDEN CITY VILLAGE	NASSAU	5
GENESEO VILLAGE	LIVINGSTON	31
GENEVA CITY	ONTARIO	31
	SENECA	29
GILBERTSVILLE VILLAGE	OTSEGO	25
GLEN COVE CITY	NASSAU	3
GLEN PARK VILLAGE	JEFFERSON	26
GLENS FALLS CITY	WARREN	24
GLOVERSVILLE CITY	FULTON	26
GOSHEN VILLAGE	ORANGE	22
GOUVERNEUR VILLAGE	ST. LAWRENCE	26
GOWANDA VILLAGE	CATTARAUGUS	31
	ERIE	31
GRAND VIEW-ON-HUDSON VILLAGE	ROCKLAND	22
GRANVILLE VILLAGE	WASHINGTON	24
GREAT NECK VILLAGE	NASSAU	8
GREAT NECK ESTATES VILLAGE	NASSAU	8
GREAT NECK PLAZA VILLAGE	NASSAU	3
GREENE VILLAGE	CHENANGO	25
GREEN ISLAND VILLAGE	ALBANY	23
GREENPORT VILLAGE	SUFFOLK	1
GREENWICH VILLAGE	WASHINGTON	24
GREENWOOD LAKE VILLAGE	ORANGE	22
GROTON VILLAGE	TOMPKINS	25
HAGAMAN VILLAGE	MONTGOMERY	25
HAMBURG VILLAGE	ERIE	31
HAMILTON VILLAGE	MADISON	27
HAMMOND VILLAGE	ST. LAWRENCE	26
HAMMONDSPORT VILLAGE	STEUBEN	34
HANCOCK VILLAGE	DELAWARE	28
HANNIBAL VILLAGE	OSWEGO	29
HARRIMAN VILLAGE	ORANGE	22
HARRISON VILLAGE	WESTCHESTER	20
HARRISVILLE VILLAGE	LEWIS	26
HASTINGS-ON-HUDSON VILLAGE	WESTCHESTER	22
HAVERSTRAW VILLAGE	ROCKLAND	22
HEAD OF THE HARBOR VILLAGE	SUFFOLK	1
HEMPSTEAD VILLAGE	NASSAU	5
HERKIMER VILLAGE	HERKIMER	26
HERMON VILLAGE	ST. LAWRENCE	26
HERRINGS VILLAGE	JEFFERSON	26
HEUVELTON VILLAGE	ST. LAWRENCE	26
HEWLETT BAY PARK VILLAGE	NASSAU	5
HEWLETT HARBOR VILLAGE	NASSAU	5
HEWLETT NECK VILLAGE	NASSAU	5
HIGHLAND FALLS VILLAGE	ORANGE	21
HILLBURN VILLAGE	ROCKLAND	22
HILTON VILLAGE	MONROE	30
HOBART VILLAGE	DELAWARE	25
HOLCOMB VILLAGE	ONTARIO	30
HOLLAND PATENT VILLAGE	ONEIDA	25
HOLLEY VILLAGE	ORLEANS	32
HOMER VILLAGE	CORTLAND	25
HONEOYE FALLS VILLAGE	MONROE	30
HOOSICK FALLS VILLAGE	RENSSELAER	24
HORNELL CITY	STEUBEN	34
HORSEHEADS VILLAGE	CHEMUNG	34
HUDSON CITY	COLUMBIA	24
HUDSON FALLS VILLAGE	WASHINGTON	24
HUNTER VILLAGE	GREENE	24
HUNTINGTON BAY VILLAGE	SUFFOLK	3
ILION VILLAGE	HERKIMER	26
INTERLAKEN VILLAGE	SENECA	29
IRVINGTON VILLAGE	WESTCHESTER	22
ISLAND PARK VILLAGE	NASSAU	4
ITHACA CITY	TOMPKINS	28
JAMESTOWN CITY	CHAUTAUQUA	34
JEFFERSONVILLE VILLAGE	SULLIVAN	28
JOHNSON CITY VILLAGE	BROOME	28
JOHNSTOWN CITY	FULTON	26
JORDAN VILLAGE	ONONDAGA	27
KEESEVILLE VILLAGE	CLINTON	26
	ESSEX	26
KENMORE VILLAGE	ERIE	32
KENSINGTON VILLAGE	NASSAU	8
KINDERHOOK VILLAGE	COLUMBIA	24
KINGS POINT VILLAGE	NASSAU	8
KINGSTON CITY	ULSTER	28
KIRYAS JOEL VILLAGE	ORANGE	22
LACKAWANNA CITY	ERIE	33
LACONA VILLAGE	OSWEGO	29
LAKE GEORGE VILLAGE	WARREN	24
LAKE GROVE VILLAGE	SUFFOLK	1
LAKE PLACID VILLAGE	ESSEX	26
LAKE SUCCESS VILLAGE	NASSAU	3
LAKEWOOD VILLAGE	CHAUTAUQUA	34
LANCASTER VILLAGE	ERIE	33
LANSING VILLAGE	TOMPKINS	25
LARCHMONT VILLAGE	WESTCHESTER	20
LATTINGTOWN VILLAGE	NASSAU	3
LAUREL HOLLOW VILLAGE	NASSAU	3
LAURENS VILLAGE	OTSEGO	25
LAWRENCE VILLAGE	NASSAU	5
LEICESTER VILLAGE	LIVINGSTON	31
LE ROY VILLAGE	GENESEE	30
LEWISTON VILLAGE	NIAGARA	32
LIBERTY VILLAGE	SULLIVAN	28
LIMA VILLAGE	LIVINGSTON	30
LIMESTONE VILLAGE	CATTARAUGUS	34
LINDENHURST VILLAGE	SUFFOLK	2
LISLE VILLAGE	BROOME	28
LITTLE FALLS CITY	HERKIMER	26
LITTLE VALLEY VILLAGE	CATTARAUGUS	34
LIVERPOOL VILLAGE	ONONDAGA	27
LIVONIA VILLAGE	LIVINGSTON	31
LLOYD HARBOR VILLAGE	SUFFOLK	3
LOCKPORT CITY	NIAGARA	32
LODI VILLAGE	SENECA	29
LONG BEACH CITY	NASSAU	5
LOWVILLE VILLAGE	LEWIS	26
LYNBROOK VILLAGE	NASSAU	5
LYNDONVILLE VILLAGE	ORLEANS	32

REFERENCE NO. 3

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Vol. 55 No. 241

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TABLE 3-6.—HYDRAULIC CONDUCTIVITY OF GEOLOGIC MATERIALS

Type of material	Assigned hydraulic conductivity [a] (cm/sec)
Clay; low permeability till (compact unfractured till); shale; unfractured metamorphic and igneous rocks	10^{-8}
Silt; loesses; silty clays; sediments that are predominantly silts; moderately permeable till (fine-grained, unconsolidated till, or compact till with some fractures); low permeability limestones and dolomites (no karst); low permeability sandstone; low permeability fractured igneous and metamorphic rocks	10^{-6}
Sands; sandy silts; sediments that are predominantly sand; highly permeable till (coarse-grained, unconsolidated or compact and highly fractured); peat; moderately permeable limestones and dolomites (no karst); moderately permeable sandstone; moderately permeable fractured igneous and metamorphic rocks	10^{-4}
Gravel; clean sand; highly permeable fractured igneous and metamorphic rocks; permeable basalt; karst limestones and dolomites	10^{-2}

[a] Do not round to nearest integer.

TABLE 3-7.—TRAVEL TIME FACTOR VALUES [a]

Hydraulic conductivity (cm/sec)	Thickness of lowest hydraulic conductivity layer(s)[b] (feet)			
	Greater than 3 to 5	Greater than 5 to 100	Greater than 100 to 500	Greater than 500
Greater than or equal to 10^{-3}	35	35	35	25
Less than 10^{-3} to 10^{-5}	35	25	15	15
Less than 10^{-5} to 10^{-7}	15	15	5	5
Less than 10^{-7}	5	5	1	1

[a] If depth to aquifer is 10 feet or less or if, for the interval being evaluated, all layers that underlie a portion of the sources at the site are karst, assign a value of 35.

[b] Consider only layers at least 3 feet thick. Do not consider layers or portions of layers within the first 10 feet of the depth to the aquifer.

Determine travel time only at locations within 2 miles of the sources at the site, except: if observed ground water contamination attributable to sources at the site extends more than 2 miles beyond these sources, use any location within the limits of this observed ground water contamination when evaluating the travel time factor for any aquifer that does not have an observed release. If the necessary subsurface geologic information is available at multiple locations, evaluate the travel time factor at each location. Use the location having the highest travel time factor value to assign the factor value for the aquifer. Enter this value in Table 3–1.

3.1.2.5 *Calculation of potential to release factor value.* Sum the factor values for net precipitation, depth to aquifer, and travel time, and multiply this sum by the factor value for containment. Assign this product as the potential to release factor value for the aquifer. Enter this value in Table 3–1.

3.1.3 *Calculation of likelihood of release factor category value.* If an observed release is established for an aquifer, assign the observed release factor value of 550 as the likelihood of release factor category value for that aquifer. Otherwise, assign the potential to release factor value for that aquifer as the likelihood of release value. Enter the value assigned in Table 3–1.

3.2 *Waste characteristics.* Evaluate the waste characteristics factor category for an aquifer based on two factors: toxicity/mobility and hazardous waste quantity. Evaluate only those hazardous substances available to migrate from the sources at the site to ground water. Such hazardous substances include:

- Hazardous substances that meet the criteria for an observed release to ground water.
- All hazardous substances associated with a source that has a ground water containment factor value greater than 0 (see sections 2.2.2, 2.2.3, and 3.1.2.1).

3.2.1 *Toxicity/mobility.* For each hazardous substance, assign a toxicity factor value, a mobility factor value, and a combined toxicity/mobility factor value as specified in the following sections. Select the toxicity/mobility factor value for the aquifer being evaluated as specified in section 3.2.1.3.

3.2.1.1 *Toxicity.* Assign a toxicity factor value to each hazardous substance as specified in Section 2.4.1.1.

3.2.1.2 *Mobility.* Assign a mobility factor value to each hazardous substance for the aquifer being evaluated as follows:

- For any hazardous substance that meets the criteria for an observed release by chemical analysis to one or more aquifers underlying the sources at the site, regardless of the aquifer being evaluated, assign a mobility factor value of 1.
- For any hazardous substance that does not meet the criteria for an observed release by chemical analysis to at least one of the aquifers, assign that hazardous substance a mobility factor value from Table 3–8 for the aquifer being evaluated, based on its water solubility and distribution coefficient (K_d).
- If the hazardous substance cannot be assigned a mobility factor value because data on its water solubility or distribution coefficient are not available, use other hazardous substances for which information is available in evaluating the pathway.

TABLE 3–8.—GROUND WATER MOBILITY FACTOR VALUES [a]

Water solubility (mg/l)	Distribution coefficient (K_d) (ml/g)			
	Karst [c]	≤10	>10 to 1,000	>1,000
Present as liquid [b]	1	1	0.01	0.0001
Greater than 100	1	1	0.01	0.0001
Greater than 1 to 100	0.2	0.2	0.002	2×10^{-5}
Greater than 0.01 to 1	0.002	0.002	2×10^{-5}	2×10^{-7}
Less than or equal to 0.01	2×10^{-5}	2×10^{-5}	2×10^{-7}	2×10^{-9}

[a] Do not round to nearest integer.

[b] Use if the hazardous substance is present or deposited as a liquid.

[c] Use if the entire interval from the source to the aquifer being evaluated is karst.

2

REFERENCE NO. 4

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
EDISON, NEW JERSEY 08837

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT

Site Name: Merrick Landfill/Disposal Plant

Address: 1600 Merrick Road, Merrick, NY 11566

County: Nassau

EPA I.D. No.: NYD980506752

Summary:

The landfill at this site has been inactive since its closure in March 1984 under an Order on Consent agreement with NYSDEC; use of the disposal plant (i.e., incinerator) was discontinued in 1980. Three on-site lagoons, previously used for settling of incinerator process water, have since been filled in. Reportedly, the landfill only received typical municipal solid waste and incinerator residue (containing heavy metals), beginning in the 1940's; there are no reported incidents of hazardous waste dumping.

The site is surrounded on three sides by Merrick Bay and its tidal inlets and marshlands; therefore, potential surface water contamination with landfill leachate and runoff is a major concern. The unconfined groundwater aquifer located just beneath the landfill is not used for drinking, and the deep confined aquifer (into which public supply wells are tapped at a depth of 500 feet) is protected from leachate by a 20-foot layer of impermeable clay and upward vertical flow. (In addition, the wells are located upgradient, in terms of lateral groundwater flow, from the landfill site.) Air transport of landfill gases and leachate volatiles (methane and ammonia) is a potential concern. NYSDEC has completed a Phase I study and is preparing for a Phase II investigation; surface water quality data are being examined and the Town of Hempstead will soon be installing shallow groundwater monitoring wells.

Priority for Inspection: High ___
Medium ___
Low X (See attachment to Part 1 of PA form.)
None ___

Recommendations:

Due to the State's current involvement at the site and the unlikelihood of drinking water contamination (deep confined aquifer), an EPA inspection does not appear necessary at this time. However, the State's Phase II study should be closely followed by EPA in the event that significant contamination of surface waters, groundwater, or air is found.

Prepared by: Amy J. Brochu, Environmental Engineer
U.S. EPA, Environmental Services Division

Date: September 3, 1986

EPA

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION

01 STATE: NY | 02 SITE NUMBER: D980506752

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site): Merrick Landfill / Disposal Plant

02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER: 1600 Merrick Road

03 CITY: Merrick | 04 STATE: NY | 05 ZIP CODE: 11566 | 06 COUNTY: Nassau | 07 COUNTY CODE: 059 | 08 CONG DIST: 2-5

09 COORDINATES LATITUDE: 40 39 08. N | LONGITUDE: 073 33 47. W

10 DIRECTIONS TO SITE (Starting from nearest public road): Intersection of Meadowbrook Parkway and Merrick Road.

III. RESPONSIBLE PARTIES

01 OWNER (If known): Town of Hempstead/Division of Sanitation

02 STREET (Business, mailing, residential): Town Hall Plaza, Main Street

03 CITY: Hempstead | 04 STATE: NY | 05 ZIP CODE: 11550 | 06 TELEPHONE NUMBER: (516) 378-4210 (James Heil, Commissioner)

07 OPERATOR (If known and different from owner): same as above (formerly)

08 STREET (Business, mailing, residential):

09 CITY: | 10 STATE: | 11 ZIP CODE: | 12 TELEPHONE NUMBER: ( )

13 TYPE OF OWNERSHIP (Check one): ☐ A. PRIVATE ☐ B. FEDERAL: ______ (Agency name) ☐ C. STATE ☐ D. COUNTY ☒ E. MUNICIPAL ☐ F. OTHER: ______ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply): ☐ A. RCRA 3001 DATE RECEIVED: __/__/__ (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: __/__/__ (MONTH DAY YEAR) ☒ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION: ☒ YES ☐ NO DATE: 1 / 3 / 85 (MONTH DAY YEAR)

BY (Check all that apply): ☐ A. EPA ☐ B. EPA CONTRACTOR ☐ C. STATE ☒ D. OTHER CONTRACTOR ☐ E. LOCAL HEALTH OFFICIAL ☐ F. OTHER: ______ (Specify)

CONTRACTOR NAME(S): Woodward-Clyde Consultants--for NYSDEC

02 SITE STATUS (Check one): ☐ A. ACTIVE ☒ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION: LF: 1940's (BEGINNING YEAR) | 1984; (ENDING YEAR) Incinerator closed in 1980.

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED

Incinerator residue (containing heavy metals) and typical municipal solid waste (i.e., garbage, rubbish, demolition debris, street sweepings and landscaping wastes). No direct evidence of hazardous wastes having been dumped on site, although suspected by NYSDEC.

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

Potential contamination of adjacent surface waters and wetlands via runoff and leachate from sandy outwash deposits located just beneath landfill. Contamination of drinking water supply (lower Magothy aquifer) very unlikely due to overlying clay and upward vertical flow of groundwater. Potential air transport of landfill gases.

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)

☐ A. HIGH (Inspection required promptly) ☐ B. MEDIUM (Inspection required) ☒ C. LOW * (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form) *SEE ATTACHMENT.

VI. INFORMATION AVAILABLE FROM

01 CONTACT: Diana Messina | 02 OF (Agency/Organization): EPA/ESD/SMB/Superfund Support Section | 03 TELEPHONE NUMBER: (201) 321-6776

04 PERSON RESPONSIBLE FOR ASSESSMENT: Amy J. Brochu | 05 AGENCY: EPA | 06 ORGANIZATION: ESD/SMB/Sprfnd. | 07 TELEPHONE NUMBER: (201) 906-6802 | 08 DATE: 9 / 3 / 86 (MONTH DAY YEAR)

Attachment to PA Form

Background on Merrick Landfill/Disposal Plant

The inactive Merrick Landfill and Merrick Disposal Plant are located on adjacent property totaling about 82 acres in Merrick, NY (Nassau County). The property is owned by the Town of Hempstead, which operated the disposal plant until 1980 and the landfill until its March 1984 closure under an Order on Consent agreement with the New York State Department of Environmental Conservation (NYSDEC). Since then, the old disposal plant building has been used as a transfer station for municipal waste and the incinerator stack has been knocked down.

Beginning in the 1940's, the landfill served as a disposal site for incinerator residue and fly ash resulting from the burning of municipal solid waste at the adjacent disposal plant. Process water from the incinerator was sent to settling lagoons and the outfalls were eventually discharged into East Bay. Solid waste quantities in excess of the disposal plant's capacity were landfilled without incineration. Finally, after operation of the incinerator was discontinued in 1980, all collected municipal waste was directly landfilled. At this time, the settling lagoons became inactive and were filled in with soil. When the landfill finally reached its capacity in 1984, it was closed.

According to the Town of Hempstead's closure plan, the landfill "has never been used for the disposal of sewage sludge (or) hazardous/toxic materials". Although no hazardous dumping incidents have been reported, NYSDEC has questioned the possibility of hazardous waste releases from the closed landfill. A "Phase I" study (background information search and site inspection) was completed for NYSDEC in April 1985, at which time a preliminary Hazard Ranking System (HRS) score of 10.61 was computed for the site. (The score could potentially be as high as 34.87 if contamination of the deep groundwater aquifer is considered a possibility.) The State is currently reviewing existing surface water quality data in preparation for a Phase II study. The Town of Hempstead will install monitoring wells tapping into the shallow groundwater aquifer; drinking water from the deep aquifer is, of course, already regularly tested by the public water companies. The Town has also made arrangements to have the methane gas extracted from the center of the landfill and used to power a small electrical generator.

Because NYSDEC has already conducted a Phase I study and has initiated a Phase II investigation of the Merrick Landfill site, it seems unnecessary for EPA to duplicate the State's work. Therefore, a "low" priority for inspection has been assigned to this site in Part 1 of the Preliminary Assessment form. However, it is strongly recommended that EPA closely follow the State's investigation and possibly take further action if significant contamination of surface water, groundwater, or air is found.

EPA

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D980506752

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- [X] A. SOLID
- [ ] B. POWDER, FINES
- [ ] C. SLUDGE
- [ ] D. OTHER ______ (Specify)
- [ ] E. SLURRY
- [X] F. LIQUID
- [X] G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS 1,900,000

CUBIC YARDS 3,800,000

NO. OF DRUMS —

03 WASTE CHARACTERISTICS (Check all that apply)

- [ ] A. TOXIC
- [ ] B. CORROSIVE
- [ ] C. RADIOACTIVE
- [X] D. PERSISTENT
- [ ] E. SOLUBLE
- [ ] F. INFECTIOUS
- [ ] G. FLAMMABLE
- [ ] H. IGNITABLE
- [X] I. HIGHLY VOLATILE
- [ ] J. EXPLOSIVE
- [ ] K. REACTIVE
- [ ] L. INCOMPATIBLE
- [ ] M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS	Unknown	—	Landfill gases and leachate.
IOC	INORGANIC CHEMICALS	Unknown	—	Ammonia in leachate.
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS	Unknown	—	Incinerator flow to old lagoons.

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
OCC	Methanol, methane	74-82-8	Landfill by-products	—	—
OCC	Carbon dioxide	—	Landfill gas	—	—
IOC	Ammonia	7664-41-7	Landfill by-product	—	—
MES	Lead	—	Settling lagoons (old)	—	—
MES	Copper	—	Settling lagoons (old)	—	—
MES	Zinc	—	Settling lagoons (old)	—	—
MES	Cadmium	7440-43-9	Settling lagoons (old)	—	—
MES	Chromium	7440-47-3	Settling lagoons (old)	—	—
MES	Nickel	7440-02-0	Settling lagoons (old)	—	—
MES	Iron	—	Settling lagoons (old)		
—	Various other chemicals	-- list of planned leachate monitoring parameters is attached (from Capping and Closure Plan, 5/84)			

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

NYSDEC Phase I Investigation (report prepared by Woodward-Clyde Consultants, 4/85)
"Capping-Closure Plan for the Merrick Landfill," Town of Hempstead, NY (prepared by Velzy Associates in 5/84)
NYSDEC files (Stony Brook and Albany)

TABLE 6-3

CONSTITUENTS TO BE TESTED FOR IN LANDFILL LEACHATE MONITORING WELLS

1. Alkalinity
2. Aluminum
3. Ammonia
4. Arsenic
5. BOD
6. Boron
7. Calcium
8. Chlorides
9. Chromium
10. Copper
11. Color
12. COD
13. Detergents
14. Fluorides
15. Hardness
16. Iron
17. Kjeldahl Nitrogen (Total)
18. Lead
19. Manganese
20. Mercury
21. Nickel
22. Nitrate
23. Nitrite
24. Phenol
25. Ph
26. Potassium
27. Phosphate
28. Sodium
29. Silver
30. Selenium
31. Specific Conductivity
32. Sulfate
33. Silicon
34. TOC
35. Total Solids
36. Zinc
37. Trace Organics:
    (a) Chloroform
    (b) Tetrachloroethylene
    (c) 1,1,1,Trichlorethane
    (d) Vinyl chloride
    (e) Carbon Tetrachloride
    (f) Trichloroethylene
    (g) PCB's

Source: "Capping-Closure Plan for the Merrick Landfill," Town of Hempstead, NY (prepared by Velzy Associates, May 1984).

EPA

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER: D980506752

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE:) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 136,250 — 04 NARRATIVE DESCRIPTION

Potential leachate into unconfined near-surface aquifer located just beneath the landfill; however, due to brackishness, this water is used only for irrigation and not for drinking. Very small possibility of contamination of deeper Magothy aquifer (60 feet below) due to overlying 20-foot clay and upward vertical flow of groundwater.

01 ☒ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE:) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 136,250 — 04 NARRATIVE DESCRIPTION

Potential for surface water contamination via runoff into surrounding waters or leachate into permeable outwash deposits located beneath the landfill; lateral groundwater flow within the outwash deposits is southward into Merrick Bay. Waters are used for recreation, fishing, and clam harvesting.

01 ☒ C. CONTAMINATION OF AIR — 02 ☒ OBSERVED (DATE: 9/21/86) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 230,000 — 04 NARRATIVE DESCRIPTION

Preliminary air quality screening suggests off-site migration of methanol, methane, and ammonia; however, levels were not considered "significant or unsafe" in the EPA study (3/84). Approx. 230,000 people live within a 4-mile radius of site.

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE:) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: — 04 NARRATIVE DESCRIPTION

Potential unknown.

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE:) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: — 04 NARRATIVE DESCRIPTION

Waste is generally well-covered except for some areas where erosion has caused garbage to protrude from beneath the vegetation. Access to site is restricted by fencing or adjacent open waters, as well as 24-hour surveillance.

01 ☒ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE:) ☒ POTENTIAL ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: 42+ acres (Acres) — 04 NARRATIVE DESCRIPTION

Possible contamination of soil in landfill (42.5 acres) via leachate, plus possible deposition of heavy metals in soil beneath inactive lagoons (previously used for settling of incinerator process water).

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE:) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: — 04 NARRATIVE DESCRIPTION

Contamination of the deep confined Magothy aquifer (at least 60 feet down) is very unlikely due to overlying clay layer and upward vertical flow of area groundwater. Public water supply wells at an intake depth of over 500 feet and serving approx. 470,000 lie within a 3-mile radius, but are located upgradient (north) of the site.

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE:) ☐ POTENTIAL ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: — 04 NARRATIVE DESCRIPTION

Landfill has been closed since 1984 and incinerator use was discontinued in 1980.

01 ☒ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE:) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 230,000 — 04 NARRATIVE DESCRIPTION

Approximately 230,000 people live within 4 miles of the site and may be affected by contamination of surface waters, near-surface groundwater, and air.

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	D980506752

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☒ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: ______) ☒ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Potential leachate drainage into wetlands and tidal flats along landfill boundaries.

01 ☒ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: ______) ☒ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (include name(s) of species)

Potential leachate drainage into wetlands and tidal flats along landfill boundaries; however, none have been designated as significant habitats by New York State.

01 ☒ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: ______) ☒ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Several controlled clamming areas are located in Merrick Bay near the southern boundary of the landfill.

01 ☒ M. UNSTABLE CONTAINMENT OF WASTES (Spills/runoff/standing liquids/leaking drums) — 02 ☐ OBSERVED (DATE: ______) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 230,000 — 04 NARRATIVE DESCRIPTION

Landfill is unlined, making leachate into near-surface groundwater likely. Also, erosion of vegetative cover has exposed garbage at some points in landfill, allowing potential for air transport and surface runoff contamination.

01 ☒ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: ______) ☒ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Potential for erosion of contaminated soils and leachate transport into surrounding waters and wetlands.

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Potential unknown.

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

No evidence of hazardous materials having been dumped on site. Unauthorized dumping by private individuals unlikely due to restricted access to site (via fencing or adjacent open waters) and 24-hour surveillance.

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

Side slopes of landfill are steep, often exceeding 50%, which could affect ease of inspection.

III. TOTAL POPULATION POTENTIALLY AFFECTED: 230,000 (within a 4-mile radius of site)

IV. COMMENTS

Above figure could be higher (470,000 people) if drinking water supply wells were to be contaminated; however, the possibility of leachate from the landfill reaching the lower confined Magothy aquifer at the 500-foot intake depth of the wells is remote.

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

NYSDEC Phase I Investigation (report prepared by Woodward-Clyde Consultants, 4/85)
"Capping-Closure Plan for the Merrick Landfill," Town of Hempstead, NY (prepared by Velzy Associates in 5/84)
NYSDEC files (Stony Brook and Albany)

REFERENCE NO. 5

REVISIONS			
NO.	BY	DATE	REMARKS

DES ....

DWN ....

CKD ....

MERRICK LANDFILL

MERRICK, NEW YORK

1 ½ 0 1 MILE

scale

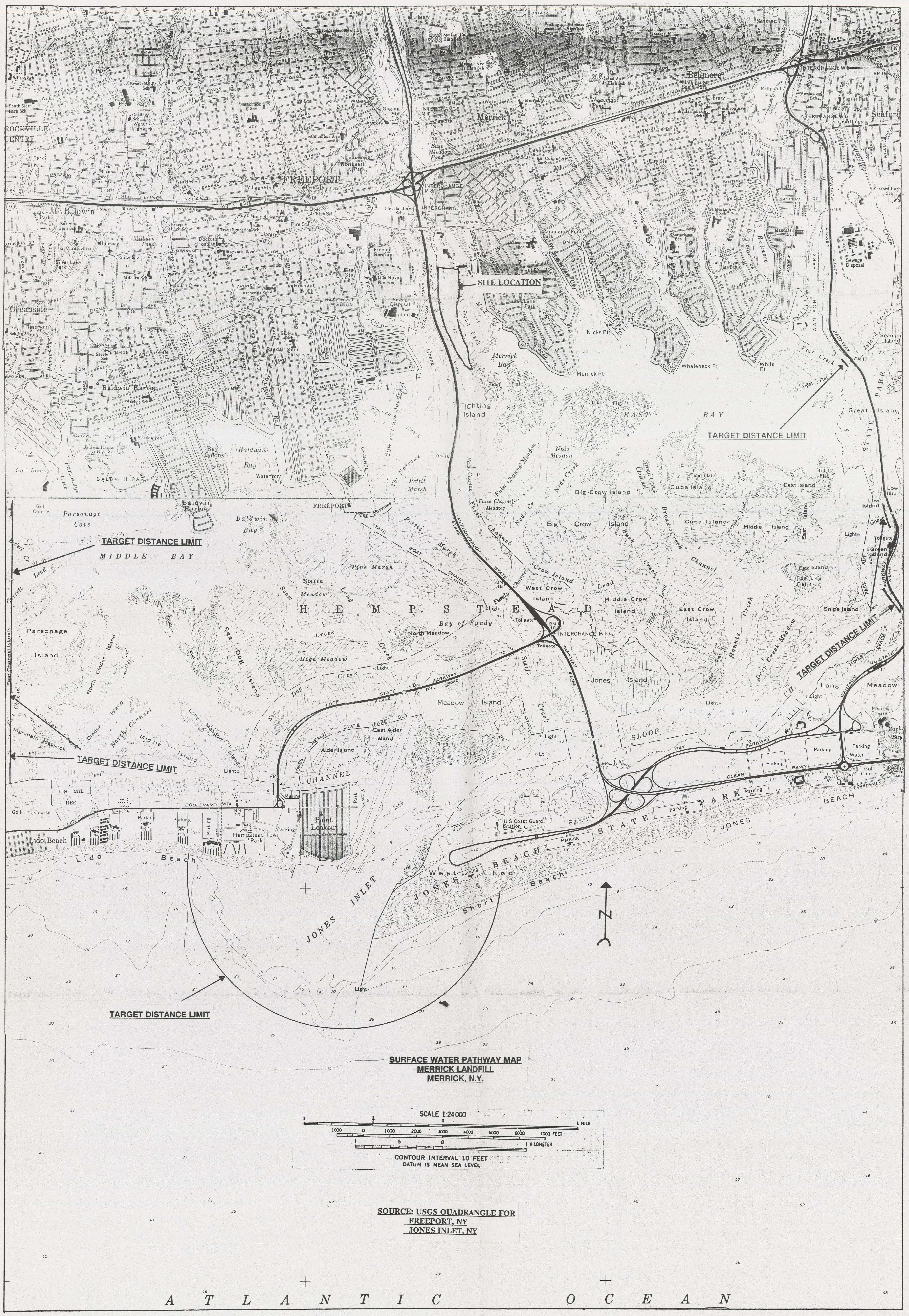
4 MILE RADIUS MAP

DATE ....

SHEET..............OF..............

DWG NO. PLATE 1

REFERENCE NO. 6


SITE LOCATION
TARGET DISTANCE LIMIT
TARGET DISTANCE LIMIT
TARGET DISTANCE LIMIT
TARGET DISTANCE LIMIT
TARGET DISTANCE LIMIT
FREEPORT
Merrick
Bellmore
Seaford
Baldwin
Oceanside
Baldwin Harbor
ROCKVILLE CENTRE
Merrick Bay
EAST BAY
MIDDLE BAY
Baldwin Bay
H E M P S T E A D
Jones Island
Meadow Island
JONES INLET
JONES BEACH
Lido Beach
Point Lookout
SURFACE WATER PATHWAY MAP
MERRICK LANDFILL
MERRICK, N.Y.
SCALE 1:24 000
CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL
SOURCE: USGS QUADRANGLE FOR
FREEPORT, NY
JONES INLET, NY
A T L A N T I C O C E A N

REFERENCE NO. 7

KEY TO MAP

500-Year Flood Boundary	ZONE B
100-Year Flood Boundary	
Zone Designations*	
100-Year Flood Boundary	ZONE B
500-Year Flood Boundary	
Base Flood Elevation Line With Elevation In Feet**	513
Base Flood Elevation In Feet Where Uniform Within Zone**	(EL 987)
Elevation Reference Mark	RM7x
Zone D Boundary	
River Mile	•M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance and flood plain management purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas. The coastal flooding elevations shown may differ significantly from those developed by the National Weather Service for hurricane evacuation planning.

For adjoining map panels, see separately printed Index To Map Panels.

Coastal base flood elevations shown on this map include the effects of wave action.

Coastal base flood elevations apply only landward of 0.0 NGVD.

INITIAL IDENTIFICATION:
APRIL 26, 1976

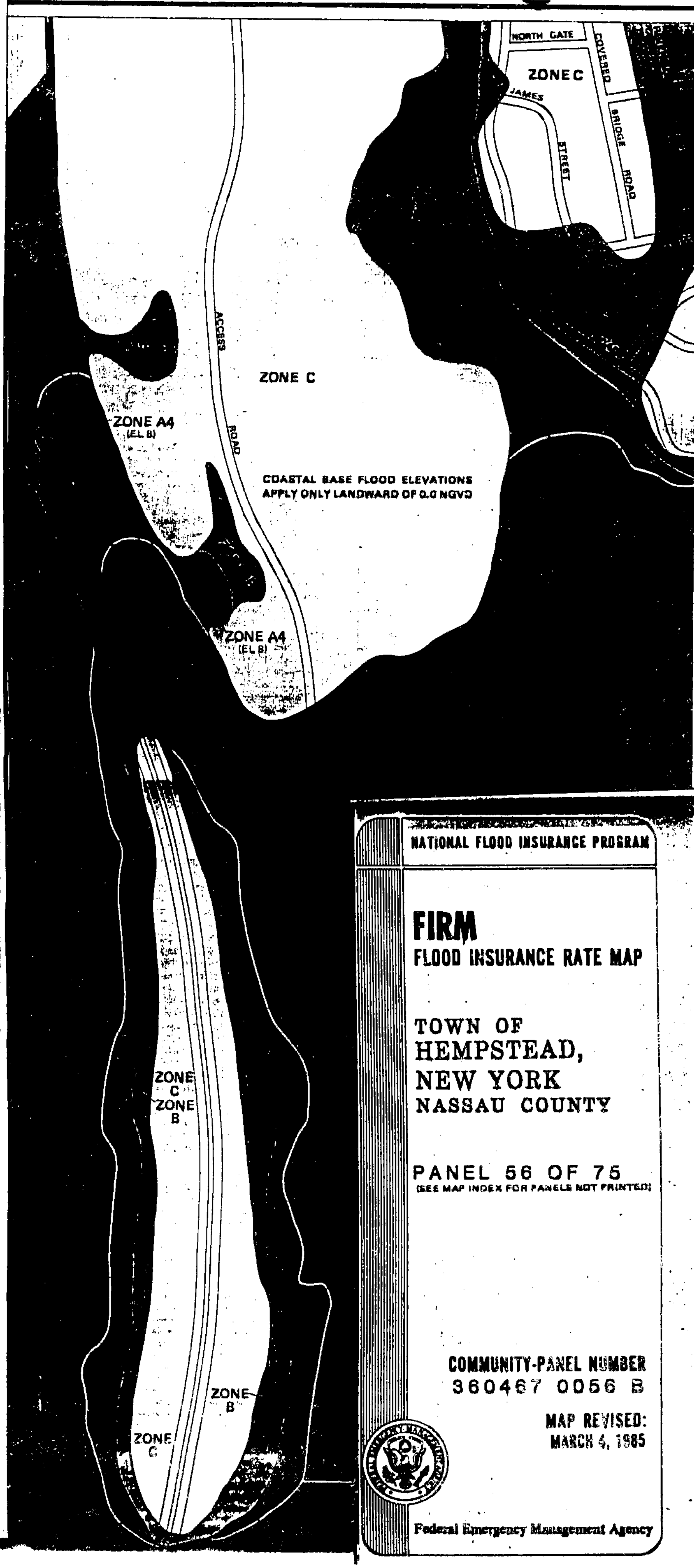
FLOOD HAZARD BOUNDARY MAP REVISIONS:
NONE

FLOOD INSURANCE RATE MAP EFFECTIVE:
APRIL 16, 1979

FLOOD INSURANCE RATE MAP REVISIONS:
March 4, 1985 - to include the effects of wave action

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program, at (800) 638-6620.

APPROXIMATE SCALE
400 0 400 FEET



NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

TOWN OF
HEMPSTEAD,
NEW YORK
NASSAU COUNTY

PANEL 56 OF 75
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
360467 0056 B

MAP REVISED:
MARCH 4, 1985

Federal Emergency Management Agency

REFERENCE NO. 8

ATLANTIC OCEAN

SURFACE WATER PATHWAY MAP
MERRICK LANDFILL
MERRICK, N.Y.

SCALE 1:24 000

1 MILE

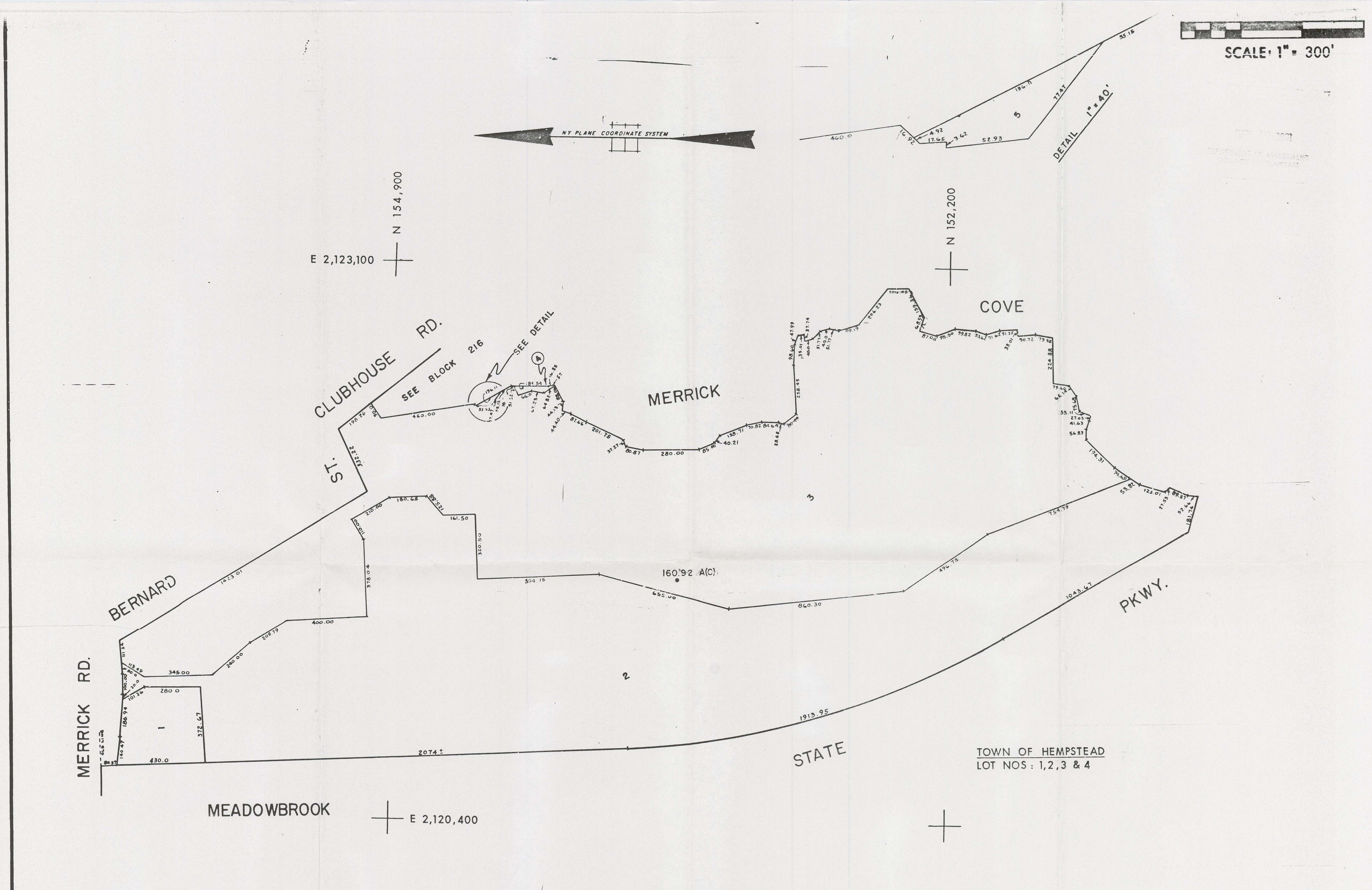
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 KILOMETER

CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL

SOURCE: NATIONAL WETLANDS INVENTORY MAPS
BASED ON USGS QUADRANGLE FOR
FREEPORT, NY
JONES INLET, NY

REFERENCE NO. 9



LEGEND

COUNTY LINE	
TOWN LINE	
VILLAGE LINE	
SCHOOL DISTRICT LINE	
PROPERTY LINE	
SPECIAL DISTRICT LINE	
BLOCK LIMIT	
LOCATOR POINT	
TAX MAP PARCEL NO.	246
CALCULATED ACREAGE	75A(C)
DEED ACREAGE	176 A
SCALED DIMENSION	327 (S)
DEED DIMENSION	185.69
REFERENCE MAPS	
MAP NO.	

SPECIAL DISTRICTS

	DIST		DIST		DIST		DIST
POLICE		FIRE PROTECTION		PUBLIC PARKING		DRAINAGE	
NASSAU COUNTY	3	MERRICK	87	MERRICK	119		
WATER		SANITARY				FIRE HYDRANT RENTAL	
				SEWER			
		REFUSE & GARBAGE		NASSAU COUNTY DISPOSAL No. 3	39	GARBAGE	
LIGHTING		MERRICK-NORTH MERRICK	4D				
TOWN OF HEMPSTEAD	47	REFUSE DISPOSAL		PARK		ESCALATOR	
LIBRARY		TOWN OF HEMPSTEAD	X	TOWN OF HEMPSTEAD	V		
		SEWAGE COLLECTION				WATER POLLUTION CONTROL	
FIRE		DIST. No.3 - MH - MERRICK HARBOR	26	IMPROVEMENT			
						STATE, COUNTY, COLLEGE	1
				SIDEWALK		HIGHWAY	2

MUNICIPALITIES

TOWN OF:
HEMPSTEAD
NORTH HEMPSTEAD
OYSTER BAY
CITY OF:
GLEN COVE
LONG BEACH
VILLAGE OF:

SCHOOL DISTRICT
MERRICK UFSD 25

NASSAU COUNTY LAND & TAX MAP

DEPARTMENT OF ASSESSMENT
ABE SELDIN
CHAIRMAN, BOARD OF ASSESSORS
MAP ADOPTED

SEC. 62
BLK. 231

CODE	SPECIAL	DISTRICT	WITHIN								
126	1	2	3	4D	26	39	47	87	119	V	X

CODE	SPECIAL DISTRICT WITHIN

CODE	SPECIAL DISTRICT WITHIN

ARCS II CONTRACT 68-W9-0051
MALCOLM PIRNIE, INC.
RECORD OF TELEPHONE CONVERSATION/AGREEMENT

File No. ____________
Date: 8/29/91 Time: 345 [] AM; [X] PM

[] Incoming Call From: ____________ Telephone No.
Affiliation: ____________

[X] Outgoing Call To: LYNN 1-516-535-2047
Telephone No.
Affiliation: Nassau County Tax Assessment Office

Malcolm Pirnie Staff: Steven T. McNulty 1-908-214-2637
(Receiving or Calling) Name Telephone No.

SUMMARY OF [X] CONVERSATION [] AGREEMENT:

Ms. Lynn supplied the following information in reference to the Hempstead Incinerator (Merrick Landfill) SI site.

site location: Section 62
Block 231 Group 1 thru 5
lot 1

A copy of the map can be obtained by mailing a request to the Nassau County Tax Assessment Office.

Follow-up Action: ____________
(Specify)

Action By: ____________
Name Action Due Date

Copy to: ____________

[] Continued

REFERENCE NO. 10

ARCS II CONTRACT 68-W9-0051
MALCOLM PIRNIE, INC.
RECORD OF TELEPHONE CONVERSATION/AGREEMENT

File No. ____________
Date: 12/6/91 Time: 1030 [X] AM; [] PM

[] Incoming Call From: ____________ Telephone No.

Affiliation: ____________

[X] Outgoing Call To: Richard Rowan 1-516-378-4210 Telephone No.

Affiliation: Town of Hempstead - Dept. of Sanitation

Malcolm Pirnie Staff: Steven T. McNulty 1-908-214-2637
(Receiving or Calling) Name Telephone No.

SUMMARY OF [X] CONVERSATION [] AGREEMENT:

Mr Rowan informed me of the following condition at the Merrick Landfill Facility. There are approximate 20 persons working regularly at the refuse transfer station and 50 total workers at the entire Town of Hempstead office complexes. The only permit information is that a permit was file for the facility to operate as an active refuse transfer station. The NYSDEC has not determined its final decision on the permit application.

Follow-up Action: I called Mr Rowan again on 12/9/91 to verify that
(Specify)
the monitoring program that samples the groundwater occurs on a semi-annual basis. Steven T. McNulty 12/9/91
He could not verify that information

Action By: ____________
Name Action Due Date

Copy to: ____________

[] Continued

REFERENCE NO. 11

ARCS II CONTRACT 68-W9-0051
MALCOLM PIRNIE, INC.
RECORD OF TELEPHONE CONVERSATION/AGREEMENT

File No.

Date: 10/15/91 Time: 2:30 [] AM; [X] PM

[X] Incoming Call From: Ms Lorie Lutzker 1-516-535-4948
Telephone No.

Affiliation: Nassau County Health Department

[] Outgoing Call To:
Telephone No.

Affiliation:

Malcolm Pirnie Staff: Steven T. McNulty 1-908-214-2637
(Receiving or Calling) Name Telephone No.

SUMMARY OF [X] CONVERSATION [] AGREEMENT:

Ms Lutzker, after reviewing my "Right-to-Know" request informed me that NYSDEC has delisted Merrick landfill from the NYS superfund list.

Follow-up Action:
(Specify)

Action By:
Name Action Due Date

Copy to:

[] Continued

REFERENCE NO. 12

ARCS II CONTRACT 68-W9-0051
MALCOLM PIRNIE, INC.
RECORD OF TELEPHONE CONVERSATION/AGREEMENT

File No. ______________

Date: 12/9/91 Time: 315 [] AM; [X] PM

[] Incoming Call From: ______________ Telephone No.

Affiliation: ______________

[X] Outgoing Call To: Paul George 1-516-751-7900 Telephone No.

Affiliation: NYSDEC - Stony Brook - Water Unit

Malcolm Pirnie Staff: Steven T. McNulty 1-908-214-2637
(Receiving or Calling) Name Telephone No.

SUMMARY OF [X] CONVERSATION [] AGREEMENT:

Mr. George informed me that there are no surface water intakes along the entire southern portion of Long Island, New York.

Follow-up Action: ______________
(Specify)

Action By: ______________
Name Action Due Date

Copy to: ______________

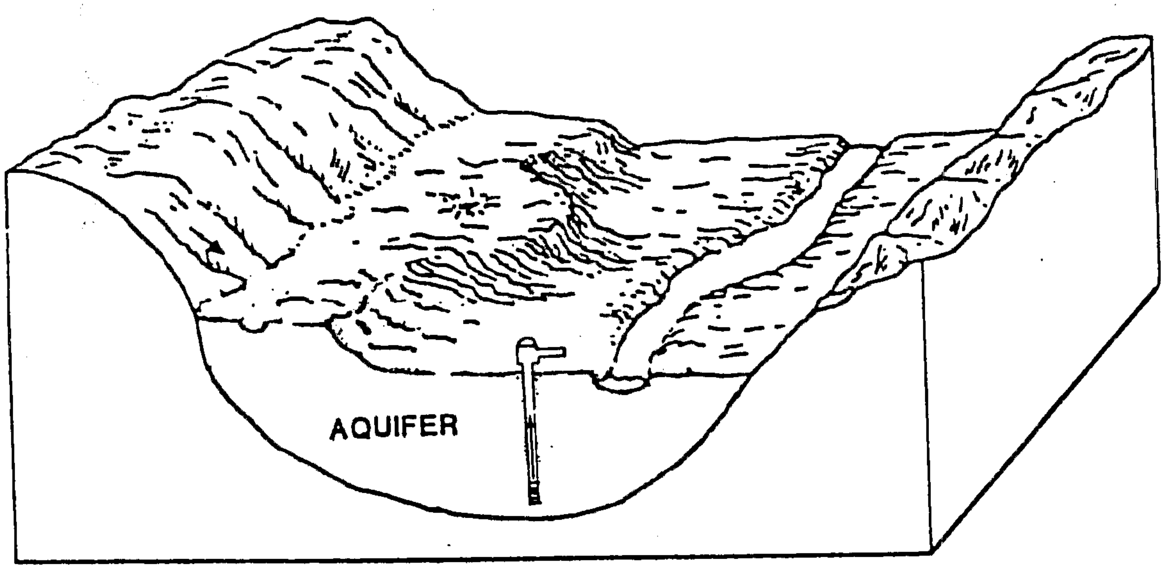
[] Continued

1

REFERENCE NO. 13

Department of Environmental Conservation

NEW YORK STATE WELLHEAD PROTECTION PROGRAM



Submittal
to
United States Environmental Protection Agency

New York State Department of Environmental Conservation
MARIO M. CUOMO, *Governor*   THOMAS C. JORLING, *Commissioner*

September 1990

2

NEW YORK STATE
WELLHEAD PROTECTION PROGRAM

SUBMITTAL
TO
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
IN
APPLICATION FOR IMPLEMENTATION FUNDS

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF WATER
ALBANY, NY

SEPTEMBER 1990

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PREFACE

This report represents a revision of the Proposed New York State Wellhead Protection Program, submitted to the U.S. Environmental Protection Agency on June 19, 1989. Following the June 1989 submittal, there was an additional review by the New York State Wellhead Protection Advisory Committee (see ACKNOWLEDGEMENTS) and by key program managers and regional staff of the NYS Department of Environmental Conservation. The initial comments of the USEPA concerning the submittal were received by New York in January 1990. In March 1990, the USEPA, in accordance with the provisions of the Safe Drinking Water Act amendments, notified the state that the submittal was incomplete. A public hearing was held in August, 1990 to complete the process. Comments received were used in revising this document, and are also discussed in an attachment to this Submittal. The revisions contained in this document primarily include many clarifications of statements made in the original document, but also include additional items to complete the original submittal (e.g., public participation summary) and items to address the adequacy concerns of USEPA.

The wellhead protection activities of the Department of Environmental Conservation in the intervening period have included further development of new source management programs (e.g., chemical bulk storage), incorporation of wellhead protection in existing programs (e.g., water supply permit program), assistance to regional planning agencies in wellhead protection activities (e.g., 205(j) projects on source identification), regional and statewide outreach and education efforts, and providing geologic information and unconsolidated aquifer delineation information.

Most importantly, the interest of county agencies and municipal governments in New York in wellhead protection has grown considerably since the June 1989 submittal, with significant activity by key counties and municipalities in Upstate New York, by the Long Island Regional Planning Board concerning Long Island's Special Groundwater Protection Areas, and by Long Island's major water suppliers. Substantial interest in training (including delineation models and management tools), and in developing protection ordinances has been expressed.

Agencies and local government associations apart from the Department of Environmental Conservation have initiated public discussion and training activities concerning wellhead protection and groundwater management.

These activities demonstrate the desired evolution of local wellhead protection programs that the New York State Wellhead Protection Program is designed to foster.

CHAPTER 1

WELLHEAD PROTECTION PROGRAM SUMMARY AND PURPOSE

1.1. Introduction

Responsible and effective environmental management demands careful focus on geographic areas where resource management is most needed to achieve the greatest benefit for a given level of effort. This is the overriding objective of wellhead area protection. The resource is groundwater. The benefit is reducing the risk of contamination of drinking water supply wells for the greatest number of people. The level of effort includes the cost of activities ranging from planning and assessment to the implementation and enforcement of appropriate groundwater quality protection controls at all levels of government. The issues to be evaluated and resolved include better defining the federal, state and local government partnership in groundwater protection, establishing the most rational geographic targeting and preventive management framework, and determining the optimum allocation of funds, if they become available, to achieve results.

This report is intended to satisfy the requirements of Section 1428 of the Safe Drinking Water Act in describing New York State's overall goal and plan for groundwater resource and wellhead area protection. Many important elements of wellhead area protection will evolve as local plans are designed and evaluated, especially aspects involving education, local government roles, and data collection and assessment. This submittal is intended to serve as supporting information in application for assistance funds from EPA to further develop and implement the plan. It presents the basic direction for using additional support obtained through new funding or reallocation of existing resources.

The elements of this report include the following:

- Duties of state agencies, local governments and public water supply systems (Chapter 2).
- Delineation of wellhead protection areas (Chapter 3).
- Identification of potential groundwater contamination sources (Chapter 4).
- Discussion of groundwater management approaches (Chapter 5).
- Discussion of groundwater-dependent public water system contingency planning (Chapter 6).
- Discussion of wellhead protection planning for new wells (Chapter 7).
- Discussion of public participation aspects (Chapter 8).

It is important to recognize that the proposed Wellhead Protection Program is not the first groundwater resource protection program in New York State. It does not replace the state's existing groundwater management program. Indeed, its goals and structure are already contained within that comprehensive program. This submittal refines and extends the geographic targeting framework already adopted as a principal groundwater protection policy. The basic groundwater program will continue to apply to the entire groundwater resource of the state and thus will provide a significant degree of protection for all groundwaters.

The remainder of this chapter provides additional introductory background on New York State's groundwater resources, its existing groundwater management program, and the general meaning of wellhead area protection.

1.2. Background: Groundwater and Groundwater Management in New York State

Groundwater is a critically important and uniquely vulnerable source of drinking water for over six million people in New York State, roughly one-third of the state's residents. These people draw their water from over 5,000 community wellfields or wells (serving over four million people), and more than 10,000 non-community public wells and an unknown number of private wells (serving over two million people). In recent years, increased use of chemicals in our society has been accompanied by increasing evidence of contamination of groundwater resources. This contamination, in some cases, has been caused by chemicals of significant toxicological concern and has been sufficient to require closure or treatment of public and private water supplies.

New York State recognized the importance of groundwater resource and drinking water protection relatively early and began the development of its groundwater quality management programs in the years following World War II. Groundwater classifications and standards evolved into groundwater discharge limitations and early wellhead protection area approaches. The adoption of 83 ambient groundwater quality standards in 1978, supplemented by drinking water quality standards, coincided with the development of comprehensive groundwater protection programs. This culminated in the final publication of two major reports, the Long Island Groundwater Management Program (1986), and the Upstate New York Groundwater Management Program (1987).

These comprehensive programs form the foundation for all groundwater management efforts in the state. They encompass many major groundwater protection programs, including but not limited to solid waste, hazardous waste, pesticides, petroleum, hazardous substances, mining, and wastewater disposal and discharge. They include the activities of all relevant state agencies and form a bridge to local government activities. Most importantly, the comprehensive program reports specifically describe geographic targeting frameworks for groundwater protection that are the basis for wellhead area protection.

More recently, the New York State Water Resources Planning Council published a comprehensive New York State Water Resources Management Strategy (1989). This Strategy, prepared with major input from the New York State Departments of Environmental Conservation and Health, from local government and public representatives, and from six other state agencies, comprises 14 volumes and addresses specific issues in 13 regions of the state. It endorses the geographic targeting frameworks of the previous Groundwater Management Program reports and supports the adoption of Watershed Rules and Regulations as a protective management approach for public water supplies.

As a general rule, wellhead area protection is a targeting approach to protect groundwater supplying specific wells. In certain cases, wellfields with multiple wells or regions with high densities of wells and complicated recharge characteristics must be considered together. Aquifer-level or aquifer segment targeting is a potentially useful approach for wellhead protection in New York because the aquifers are typically not geographically extensive (Upstate New York) or are pumped using a great number of wells (Long Island).

An important aspect of New York State's groundwater program is that <u>all</u> fresh groundwaters in the state are classified for best usage as a source of potable water supply (Class GA) regardless of location or current use. The comprehensive set of ambient groundwater quality standards and guidelines apply to all groundwater. These standards and guidelines (which include drinking water standards) underlie all major groundwater protection programs currently operating or under development.

New York's groundwater management programs have either already adopted or have begun to set a targeting framework that goes beyond commonly recognized wellhead area concepts. In Nassau and Suffolk counties (which share a single aquifer system on Long Island), considerable effort has been devoted to the delineation and revision of the boundaries of eight hydrogeologic zones. The Deep Flow Recharge Area (which comprises three of these zones) is considered to be the highest priority area for protecting wells in the deeper Magothy and Lloyd aquifers. Management program targeting on Long Island is keyed to these eight zones.

Additionally, nine Special Groundwater Protection Areas (SGPAs) have been delineated on Long Island and are the subject of an extensive planning effort funded in part by New York State and by the Long Island Regional Planning Board. Suffolk County has also defined "Water Supply Sensitive Areas" for protecting wells in the Glacial aquifer. The implementation of wellhead area

8

protection on Long Island will not replace this targeting approach. Additional geographic assessment may be included in the Wellhead Program for Long Island. It is important to emphasize that management program targeting and implementation are ultimately the most critical aspects of wellhead protection. The groundwater protection accomplishments of county-wide ordinances on Long Island must also be recognized.

In Upstate New York, unconsolidated aquifers are not as extensive as on Long Island. A considerable degree of geographic targeting has been achieved by the mapping and categorizing of Upstate aquifers. Many of these are relatively thin deposits of glacial drift in narrow valleys (less than one or two miles wide). Certain state-level programs, particularly waste management and disposal, are already strongly tied to these delineations.

The partnership between federal, state and local government is perhaps the most important part of a successful wellhead protection effort. Certain local land use control elements of a successful program are not within the state's statutory authority and are more appropriately implemented at the local level. Under the home rule provisions of New York State Law, towns, cities and villages are responsible for regulating land use. Land use controls are an important component of wellhead protection plans.

The state/local partnership is also important in adjusting protection efforts to be sensitive to local and regional differences in the groundwater resources and vulnerability, uses, programs, and local capacity for management. Local authorities in many areas of the state also have the principal authority for inspecting and testing potential contamination sources and have important roles in enforcement.

1.3. Wellhead Protection Program: Purpose and Goal

The purpose and goal of New York State's Wellhead Protection Program are to protect wellhead areas within New York State from contaminants which may have any adverse effects on the health of persons, as described in the federal Safe Drinking Water Act. This goal is more explicitly described in the adopted New York State Groundwater Management Program as follows:

1. <u>Protect and conserve groundwater resources for the best use as drinking water supply</u>.

2. <u>Emphasize problem prevention</u>.

3. <u>Target the groundwater program to most effectively use available program resources by focusing special emphasis on critical high-yielding aquifer systems</u>.

4. <u>Foster a state/local partnership</u>.

The quantity management goal of the comprehensive program has been deleted from this list. However, the Wellhead Protection Program, essentially a quality management effort, is indirectly supportive of the quantity goal because protection of existing wells reduces the need to abandon supplies and develop new sources.

The key goal for emphasis in the Wellhead Protection Program is the third, that of geographic targeting, which has been left in the original groundwater program wording above. Part of the emphasis of the Wellhead Protection Program will be to refine and strengthen this goal.

The Wellhead Protection Program will promote targeting of staffing and funding resources and adjust program operations to achieve the maximum water quality protection benefits. Determining the optimum balance between expenditures on geographic assessment (delineation and mapping) and expenditures on improved enforcement of existing programs and development of new programs is the key challenge in developing the wellhead protection effort. This balance will differ in different areas of the state. In all areas of the state, a major need is actual program implementation and enforcement.

Wellhead protection cannot be viewed in a discrete, piecemeal fashion. The steps of delineation, source inventory and source management and control must be considered together. A scheme of very costly groundwater flow delineation analyses cannot be consistent with the overall wellhead protection objectives if they unduly diminish funds available for management program implementation or if the management program does not require great sophistication. Increased refinements of delineations are justifiable to the extent that corresponding refinements in management and enforcement are practical and possible.

1.4. Wellhead Protection Program Summary

This summary is an overview of material developed in more detail in Chapters 2 through 8.

1.4.1. Agency Responsibilities

The Department of Environmental Conservation (DEC) is the principal agency responsible for developing and implementing state-level aspects of the Wellhead Protection Program and for coordination. The Department of Health (DOH) is responsible for certain aspects related to public water supply well data, contingency planning, new well planning, and Watershed Rules and Regulations. Regional and county planning agencies and county governments are responsible for county-level planning, management and educational outreach elements in the overall program, in addition to any county-level ordinances developed for wellhead protection. Town, village and city governments are responsible for local land use control, local ordinances and other local-level aspects of wellhead protection. Water suppliers will have a role in developing local Watershed Rules and Regulations, education, land acquisition and other program aspects determined by DEC and DOH. The educational effort will be shared by all levels, including Cooperative Extension, the universities and the State Education Department. Federal agencies and other state agencies will participate as appropriate, as coordinated by DEC with the assistance of EPA for federal agencies.

1.4.2. Wellhead Protection Area Delineation

The Safe Drinking Water Act defines a Wellhead Protection Area (WHPA) as "the surface and subsurface area surrounding a water well or wellfield, supplying a public water system, through which contaminants are reasonably likely to move toward and reach such water well or wellfields." This definition is not specific because there is no time framework and because there is a requirement that contaminants be reasonably likely to reach the well, a condition that is very difficult to accurately predict. States are given flexibility by the Safe Drinking Water Act in determining delineation approaches.

New York State proposes that unconsolidated aquifer boundaries serve as the fundamental delineation of wellhead protection areas and that a multiple zone approach be used within the total WHPA for varying management relative to risk. This approach is modified for Long Island and for bedrock aquifers, as described in Chapter 3. New York's approach proposes to allow local flexibility in an evolutionary process of delineation refinements, and to allow utilization of previously delineated protection areas, where appropriate.

There are many distinct advantages in this overall approach. A very important advantage is that considerable aquifer characterization and mapping work has already been accomplished. Second, it is consistent with the evolution and principal policies of both the comprehensive New York State Groundwater Management Program (1987) and New York State Water Resources Management Strategy (1989), in addition to the New York State Watershed Rules and Regulation policies. Third, it focuses attention of local governments on the entire aquifer resource and facilitates contingency planning and new (or future) well protection. Finally, it provides a base within which more sophisticated delineations (e.g., subdividing the overall WHPA) can be made as programs require and funding permits.

A possible drawback of using aquifer boundaries--that aquifers may be broad regional systems--is not a major problem in most of New York State. In Upstate New York most public water supplies using groundwater are in unconsolidated aquifers of rather limited areal extent. Most important recharge areas are within the boundaries of the unconsolidated aquifers, another advantage of this approach.

Chapter 3 provides further details and background on wellhead protection area delineation.

1.4.3. Potential Contamination Source Identification

The New York State Wellhead Protection Program proposes to use the classification of potential contamination sources based on process or operation proposed by the Office of Technology Assessment and endorsed by USEPA.

Many source inventory and identification programs are already in place or are being developed for individual groundwater protection programs. These include but are not limited to registries of hazardous waste disposal sites, petroleum storage locations, the Industrial Chemical Survey, records of the State Pollutant Discharge Elimination System (SPDES), and the hazardous material storage registry (in development). Similar information is available for other potential sources (mining, municipal waste, etc.). Other inventories (pesticides, salt storage) are needed and certain improvements (locational data, data formats) are needed in the existing registries.

The effort expended in pinpointing and mapping any possible source will be determined in balance with the effort needed to manage the most important sources. The current registries will be used as much as possible at the greatest level of geographic detail feasible within the constraints of the registry. Using these registries, some sources outside of the actual wellhead protection areas may be listed. An effort will be made to explore new formats for processing available registry data to maximize compatibility and ease of interpretation.

Chapter 4 provides further detail on potential contamination source inventory.

1.4.4. Groundwater Management Approaches

The emphasis in groundwater management efforts from the state level will be to continue to develop and implement the program recommendations made as part of the comprehensive groundwater management program, with a special focus on aspects relevant to geographic targeting of program elements.

Groundwater protection for all fresh groundwaters in New York is accomplished in the existing state regulatory programs by classifying all fresh groundwaters as potential drinking water sources, and using the stringent 6 NYCRR Part 703 groundwater standards as the management objectives statewide. Solid and hazardous waste management programs formally utilize geographic targeting as a management tool. Other state-level programs (e.g., spill response) have integrated major water supply aquifer targeting into day-to-day functions even though such targeting may not be explicitly stated in written policy.

Current and developing state-level programs will be evaluated to determine useful new approaches or cost-effective methods for targeting management practices. The needs identified will be considered in allocating available funds or staff, soliciting new funds, and in regulatory and program development.

Local governments, with the authority to regulate land use, have the capability of controlling new facilities through zoning and site plan review. Density of new development can also be controlled through zoning. Adoption of specific groundwater protection ordinances is also an avenue available to municipal and county governments, through sanitary codes or other approaches. Finally, land acquisition for groundwater protection is a viable management tool for local governments and water suppliers.

Watershed Rules and Regulations can be promulgated by the New York State Health Department following initiation and development by public water purveyors, whether municipal or privately-owned. The WHPA delineation proposals in this submittal are compatible with the models for Watershed Rules and Regulations.

The state will also use its available resources and explore new approaches for technical assistance, outreach and education to local governments to encourage participation and local initiatives. The potential for using "facilitated training", or training intermediate parties to train local groups, will be considered.

Management aspects are described in further detail in Chapter 5.

1.4.5. Contingency Planning

The existing contingency planning requirements of the New York State Department of Health's emergency planning program meet and exceed the requirements of Section 1428(a)(b) of the Safe Drinking Water Act. The existing New York program deals with all forms of water supply emergencies. In addition, the Superfund Amendments and Reauthorization Act (SARA) Title III emergency planning activities in New York support contingency planning needs for wellhead protection.

Chapter 6 further discusses contingency planning.

1.4.6. New Well Planning

The existing New York State Water Supply Permit Program enables the Department of Environmental Conservation to require, as part of the permit approval process, the adoption of a groundwater (or wellhead) protection plan for proposed new wells. The New York State Wellhead Protection Program proposes that development of such a plan be required for new wells. The plan may include Watershed Rules and Regulations, local ordinances (town, village, or city), or county ordinances. Such plans often will entail the collection of hydrogeologic information to support WHPA delineations. Such plans must be consistent with existing authorities of the water supplier and they may include intermunicipal or county-level agreements or Watershed Rules and Regulations (NYSDOH).

This aspect of the Wellhead Protection Program is further discussed in Chapter 7.

1.4.7. Public Participation

There has been substantial public participation in the evolution of these proposals, particularly in the two major planning and strategy development projects from which New York's Wellhead Protection Program was derived. The public participation in both the New York State Groundwater Management Plan and the New York State Water Resources Management Strategy fully adhered to public participation procedures.

In addition, the Wellhead Protection Program development has established a Wellhead Protection Advisory Committee to assist in development of the submittal.

Public participation is further discussed in Chapter 8.

1.5. Evaluation of Wellhead Protection Program Progress

Program progress reports which evaluate Wellhead Protection Program development and implementation will follow one of two alternative approaches. In the event that an Assistance Agreement is adopted between EPA and DEC in accordance with the provisions of the Safe Drinking Water Act, three types of reports will be submitted to EPA which are specific to the Wellhead Protection Program and which follow the "Guidance for Applicants for State Wellhead Protection Program Funds Under the Safe Drinking Water Act" (EPA 440/6-87-011).

These are:

a. Interim and End-of-Year Progress Reports;

b. Biennial Status Report; and

c. Annual Financial Status Report.

The precise content and schedule for these reports would be negotiated as part of the Assistance Agreement.

If EPA does not provide assistance and an Assistance Agreement is not established, the progress of the Wellhead Protection Program will be reported within the context of the already established procedures for reviewing the DEC Division of Water Management Plan between DEC and EPA.

CHAPTER 3

WELLHEAD PROTECTION AREA DELINEATION

3.1. Introduction and Institutional Processes

3.1.1. Introduction

The comprehensive New York State Groundwater Management Program, developed in the early 1980's and published in revised and final documents in 1986 (for Long Island) and 1987 (for Upstate), recommended key policies and program initiatives endorsing geographic targeting and critical area protection. These concepts were forerunners of the Safe Drinking Water Act's Wellhead Protection Program. Significant progress has been made in different aspects of geographic targeting of programs and in different parts of New York State. New York acknowledges these accomplishments as an integral part of its overall Wellhead Protection Program.

Delineation determines geographic areas for which different levels of groundwater protection activities are to be instituted. The Wellhead Protection Program in New York State is intended to accomplish a wider recognition of targeting objectives by all levels of government, by citizens in general, and to begin an evolutionary process toward improved targeting and protective program implementation.

The basic wellhead protection delineation approach in New York State recognizes aquifers as the fundamental geographic unit for targeting management efforts. This approach must be modified where aquifers are broad regional systems (DEC considers this case to occur only on Long Island), or where aquifers are not well characterized (considered to be the case for bedrock aquifers, in general). Elsewhere, the unconsolidated aquifers of New York tend to be of limited areal extent and they generally include the important recharge areas within their boundaries. These unconsolidated aquifers also are the source of the large majority of groundwater-derived public water supply systems.

The New York State Wellhead Protection Program proposes that unconsolidated aquifer boundaries (the land surface overlying the aquifer) serve as the baseline definition for the overall wellhead protection area (WHPA). For the baseline definition, both confined and unconfined unconsolidated aquifers are grouped together. Revisions are allowable based on site-specific evaluations. This aquifer boundary approach is proposed to be modified on Long Island and for wells in bedrock aquifers as described in Section 3.2. For all public water supply wells, specific proposed WHPA delineation policies are described in Section 3.2.

The aquifer boundary approach for the overall WHPA has several distinct advantages. It takes advantage of considerable recent and ongoing work in mapping and detailed assessments of aquifer boundaries. Incorporating this work directly into the Wellhead Protection Program provides a practical way for more effective targeting to move forward rapidly rather than being constrained by the need to perform modeling to delineate protection areas.

The aquifer approach also encompasses other non-public wells and potential future well sites, and places major focus on the high-yielding groundwater resources which are most important and most vulnerable. This last aspect is considered very important in the education component of wellhead protection, both for local officials and for the general public.

Wellhead protection area delineation is an evolutionary process. The first need for refinement is the further subdivision of the total wellhead protection area, as required for differentiated management objectives. A second area for potential refinement is delineation of the overall WHPA in the Glacial Aquifer on Long Island and in bedrock aquifers. Issues related to these topics are reviewed in both Sections 3.2 and 3.3. Flexibility for refinement or revision is very important due to the wide variability in hydrogeologic settings, data availability, and local degree of contamination threat in New York State.

3.1.2. Institutional Processes for Overall Delineation Policies

Advisory committee and work group input into the original comprehensive Groundwater Management Program was substantial. The basic concept of geographic targeting was set forth in that program. The groups included:

- Federal Agencies (EPA, USGS)
- State Agencies (DEC, DOH, DOT, Agriculture & Markets, Energy Office, Geological Survey)
- Cornell University
- County Agencies (Health, Planning)
- Associations (Conference of Mayors, American Water Works Association, Business Council)
- Citizen Groups (NRDC, League of Women Voters)

DEC reconvened most of the original contributors into an advisory committee to assist in guiding the Wellhead Protection Program, with particular emphasis on delineation issues. Added to the original group have been:

- State Agencies (Department of State)
- County Agencies (a wider range of county participants)
- Regional Agencies and Commissions (additional planning and legislative commissions)
- Associations (Association of Towns, American Water Resources Association)

The new group, the Wellhead Protection Advisory Committee, has also included additional participation from the U.S. Geological Survey and DEC geological staff.

The delineation approach proposed in this submittal was recommended by the DEC Groundwater Management Section (responsible for developing the program) and agreed to by the Wellhead Protection Advisory Committee (members listed in front of submittal). The delineation approach directly conforms with the policies in the formally adopted Upstate New York Groundwater Management Program and Long Island Groundwater Management Program.

The DEC has also established a Memorandum of Understanding (MOU) with the DOH concerning the development of the Wellhead Protection Program. Additional MOU's will be developed as needed to institutionalize interagency working arrangements.

To support the technical needs of DEC and of local governments in carrying out and refining delineations, DEC plans to convene an ongoing Delineation Technical Workgroup consisting of geologists and groundwater management staff of DEC, DOH, State Geological Survey, USGS, and local governments. This group would consider revisions or improvements in the overall delineation approach, and would essentially be concerned with hydrogeologic aspects of the program rather than administration or contamination source control. The mission of this group is to provide recommendations to the DEC staff responsible for the overall Wellhead Protection Program. It will be convened upon EPA approval of New York State's submittal and will meet on at least a semi-annual basis or as needed.

Local authorities involved in wellhead protection may vary, as discussed elsewhere in this submittal. Therefore, uniform institutional processes at the local level will not be proposed across the entire state. Local agencies may act according to their own needs and authority. However, in all cases where Watershed Rules and Regulations are utilized as the local wellhead protection approach, the existing requirements of the New York State Department of Health (DOH) will be followed. Similarly, for all new wells, the institutional requirements of the New York State Department of Environmental Conservation's (DEC) Water Supply Permit Program will apply.

The proposed responsibility for initiating refinements of the baseline delineations described in this submittal will depend upon the regulatory approach adopted. Delineation refinements to be incorporated in Watershed Rules and Regulations approaches will be initiated and performed by water purveyors. Delineation refinements to be incorporated in county, town, village or city ordinances (including local public health ordinances) will be initiated and performed by the corresponding political authority. Delineation refinements to be incorporated in state-level regulatory programs will be performed by DEC.

In practice, most local activities will involve coordination with the State DEC and DOH. Each Department routinely reviews local activities to ensure that there are no conflicts with respect to policies and procedures and advises on the availability of technical information for delineation purposes. The overall coordination for aspects specifically related to the WHPP is the responsibility of DEC.

Other institutions, particularly the U.S. Geological Survey and Cornell and other universities, may be involved in special projects or case studies, as coordinated by DEC.

3.2 Delineation Criteria, Thresholds and Methods

3.2.1. Background - Existing Geographic Targeting

The existing, and still evolving, geographic targeting framework for groundwater protection provides a priority system for managing risks to groundwater. Following is a brief summary:

- Groundwater Classification - 6 NYCRR Part 703

  Ambient water quality standards and guidelines apply to all Class GA (fresh) groundwaters. Class GA groundwaters are defined as having best use as a source of drinking water and must meet New York State's drinking water standards in addition to the ambient standards. State management programs use this framework for protection of all fresh groundwaters in New York State.

- Unconsolidated Aquifers

Mapping of unconsolidated aquifers has progressed significantly including State-defined primary and principal aquifers which are subsets of the unconsolidated aquifers. Site-specific detailed mapping is still in progress.

Primary and principal aquifers are generally similar geologically (both are highly productive unconsolidated deposits); primary aquifers are those which have large populations using them as drinking water sources. Primary aquifers have high priority for mapping additional hydrogeologic data through the DEC/USGS cooperative program, and in special Long Island programs.

These delineations are used in the process for siting new waste disposal facilities.

- Long Island Hydrogeologic Zones

Eight hydrogeologic zones have been delineated, covering all of Long Island. Three of these together comprise the Deep Flow Recharge Area. Management program initiatives (e.g., hazardous substance storage) are based on this Deep Flow Recharge Area.

- Special Groundwater Protection Areas

Nine Special Groundwater Protection Areas have been delineated within the Deep Flow Recharge Area in both Nassau and Suffolk Counties and are currently the subject of a planning project by the Long Island Regional Planning Board.

- Other Geographic Targeting Approaches

Suffolk County has specifically defined "Water Supply Sensitive Areas" which include zones 500 feet downgradient to 1,500

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feet upgradient of public wells in the Upper Glacial Aquifer.

Watershed Rules and Regulations are promulgated by the NYS Department of Health upon initiation by local water purveyors. These include delineations of protection management zones for public water supply wells. The WRR delineations do not conflict with the wellhead protection area delineation policies proposed in this submittal.

The NYS Solid Waste Management Program, in 6 NYCRR Part 360, has defined "public water supply wellhead area" as the surface and subsurface area between a public water supply well or wellfield and the 99% theoretical maximum extent of the stabilized cone of depression of that well or wellfield considering all flow system boundaries and seasonal fluctuations. New landfills are banned in these areas, in addition to all primary and principal aquifers in the Upstate area. Special provisions are defined in law for Long Island siting. As with the Watershed Rules and Regulations, there is no conflict in terminology between the Part 360 public water supply wellhead area and the overall wellhead protection area proposed in this submittal. The overall protection area includes, and is larger than, the Part 360 wellhead itself. For landfill siting, Part 360 regulations will prevail. Part 360 determinations are made only for proposed landfill siting cases.

Other setback requirements have been utilized in various state or local management programs. When used, such as for pesticides (e.g., aldicarb) or septic tanks, the setbacks apply to all wells, public or private. As with the other targeting approaches, such setbacks do not conflict with the proposed wellhead protection area policies.

- Well Construction Specifications

Direct protection of the wellhead itself is achieved through adoption of construction specifications and standards. These are administered by the New York State Department of Health and follow the "Recommended Standards for Water Works" (NYS Health Department Bulletin #42, 1982). They apply to public water supply wells.

3.2.2. Wellhead Protection Area Delineation Objectives

The USEPA guidance for development of wellhead protection programs (Guidance for Applicants for State Wellhead Protection Program Assistance Funds under the Safe Drinking Water Act, EPA 440/6-87-011) contains the expectation that proposed programs will be designed to provide protection from three types of threats: direct introduction of contaminants in the immediate well area, microbial contaminants, and chemical contaminants. The first is dealt with through well construction and completion standards to be applied at the wellhead itself. The second is managed by delineating a zone to keep potential sources sufficiently distant from the well to allow die-off of the microorganisms. Establishing a minimum distance by measurement or by time-of-travel is the most common procedure for delineating areas for protection against microbial contamination.

To achieve protection against chemical contamination, EPA suggests three delineation approaches: delineation of wellfield management areas, contamination attenuation zones, or remedial action zones. Since chemicals can travel long distances, all or part of the recharge area for a well becomes the zone to be delineated for protection efforts.

The overall goals of New York State's delineation approach are essentially a combination of the wellfield management and remedial action zone goals described by EPA.

Wellfield management is used to define areas where heightened levels of protection will be

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emphasized. A number of different zones may be delineated for a single water supply to provide different levels of management. The management options may range from selected land use prohibitions to specialized design specifications, enhanced facility inspections, or increased monitoring and education.

The remedial action area approach excludes high risk activities from a specifically defined zone but still allows them in more distant recharge areas. This may be refined by varying exclusions in different zones according to risk or the importance of the activity. The remedial action area concept is best applied to new or changing land uses, whereas wellfield management may be applied to existing or new land uses.

The contamination attenuation zone approach described by EPA is difficult to strictly apply due to limited capabilities to accurately predict chemical migration and persistence. In addition, the New York State groundwater standards apply to all fresh groundwaters, reducing the utility of an attenuation zone approach.

3.2.3. Delineation Policy

The underlying objective of delineation is to use different degrees of management to control risks to water supplies. The significant diversity in geological conditions, aquifer use, and in local government capabilities across New York State indicates that the approach to delineation can not be uniform and rigid for all locations.

The ideal technical goal of wellhead delineation is to have sufficient knowledge of the hydrogeology of each public water supply well or wellfield to allow precise determination of the catchment area along with accurate times-of-travel for the entire flow system. Such information is not uniformly available across the state. New information will become available unevenly as funding from various local, state and federal sources is applied to specific priority areas.

In this setting, the New York State Wellhead Protection Program proposes general recognition of high-yielding aquifers (both confined and unconfined) as the fundamental wellhead protection area units. As described in Section 3.2.4., this policy recognizes that more targeted delineations will be necessary on Long Island because it is entirely an aquifer. Also, bedrock aquifers are not adequately characterized now to allow this approach; however, most of the major, high-yielding aquifers in New York are in unconsolidated deposits. Within the wellhead protection area, delineation of an area designated as the remedial action area is proposed, as described in Sectin 3.2.5.

This policy is intended to reinforce public and management program recognition of the need to protect high-yielding aquifers. It takes advantage of considerable past and ongoing work on aquifer mapping and delineation and will permit further progress in communities which have already delineated aquifer boundaries and protection areas. These communities may directly proceed to management implementation or may utilize available funds on more advanced hydrogeologic evaluations within the WHPA, depending on local needs and goals.

Within this framework, utilization of alternative delineation approaches (such as time-of-travel) is allowed and encouraged. In most cases, such alternative approaches would be applied to subdividing the WHPA within the unconsolidated aquifer boundaries for applying different levels of management. The WHPA itself would remain the area defined by aquifer boundaries. In some cases, such as for bedrock aquifers, the alternative approaches may be used to redefine the WHPA itself. The Department of Environmental Conservation will be responsible for providing guidance for such alternative approaches.

3.2.4. Wellhead Protection Area Delineations

The wellhead protection area delineation approach is summarized in Table 3.1. It recognizes that the aquifer system on Long Island and bedrock aquifers in Upstate New York must be treated differently than the unconsolidated aquifers in Upstate. The unconsolidated aquifer boundaries for the wellhead protection areas are those delineated on a series of maps titled

TABLE 3.1.
WELLHEAD PROTECTION AREA
DELINEATION SUMMARY

Geographic Region	Aquifer Area	Wellhead Protection Area Baseline Delineation
Long Island	Magothy & Lloyd Aquifers	Deep Flow Recharge Area
	Glacial Aquifer	Simplified Variable Shape: 1,500 ft. radius upgradient 500 ft. radius downgradient
Upstate	Unconsolidated Aquifers	Aquifer Boundaries (land surface)
	Bedrock Aquifers	Fixed Radius: 1,500 ft. radius

"Potential Yields of Wells in Unconsolidated Aquifers in Upstate New York" by the U.S. Geological Survey. Specifically, these maps, distributed for sale by the U.S. Geological Survey, are as follows:

1. Bugliosi, E.F., et al., 1988. Potential Yields of Wells in Unconsolidated Aquifers in Upstate New York - Lower Hudson Sheet. Water Resources Investigations Report 87-4274. U.S. Department of the Interior, Geological Survey, Albany, NY.

2. Bugliosi, E.F., et al., 1988. Potential Yields of Wells in Unconsolidated Aquifers in Upstate New York - Hudson Mohawk Sheet. Water Resources Investigations Report 87-4275, U.S. Department of the Interior, Geological Survey, Albany, NY.

3. Bugliosi, E.F., et al., 1988. Potential Yields of Wells in Unconsolidated Aquifers in Upstate New York - Adirondack Sheet. Water Resources Investigations Report 87-4276, U.S. Department of the Interior, Geological Survey, Albany, NY.

4. Miller, T.S., 1988. Unconsolidated Aquifers in Upstate New York - Finger Lakes Sheet. Water Resources Investigations Report 87-4122, U.S. Department of the Interior, Geological Survey, Albany, NY.

5. Miller, T.S., 1988. Potential Yields of Wells in Unconsolidated Aquifers in Upstate New York - Niagara Sheet. Water Resources Investigations Report 88-4076. U.S. Department of the Interior, Geological Survey, Albany, NY.

The boundaries illustrated on these maps serve as the total wellhead protection areas for public water supplies utilizing those aquifers. In certain cases, more detailed aquifer boundary maps or determinations for primary or principal aquifers (subsets of the full range of unconsolidated aquifers) have been or will be made by the U.S. Geological Survey or NYS Department of Environmental Conservation. These more detailed boundary determinations will generally supersede boundaries illustrated on the above referenced maps as "revised" delineations of wellhead protection areas.

Both unconfined and confined unconsolidated aquifers are included on these maps and both are included in this definition of the overall wellhead protection area.

For all public water supplies utilizing groundwater, the overall wellhead protection area (WHPA) delineation will be subdivided into two parts. The innermost zone is referred to as the Remedial Action Area. The remainder of the WHPA is referred to as the Wellfield Management Area. The terminology is derived from the EPA guidance referenced earlier. Depending on local management objectives for groundwater protection, local hydrogeology, and data availability and resource availability, the Wellfield Management Area may be further subdivided. This further subdivision of the Wellfield Management Area would be considered a refinement of the "baseline" delineation. Methodologies, criteria and thresholds used for such revisions are flexible. Approaches proposed by local water purveyors will be evaluated and approved or disapproved upon submittal to the New York State Department of Environmental Conservation.

The term "baseline" delineation, as used in this submittal, is intended to represent the initial WHPA delineation advocated by the Department of Environmental Conservation. The delineation may be directly utilized in implementing management activities for groundwater protection. However, if site-specific conditions suggest that alternative delineations are appropriate (including the further subdivision of the Wellfield Management Area already cited), those delineations may be accepted by the Department of Environmental Conservation. The evolution of improved delineation techniques, the growing availability of hydrogeologic information, and the longer-term enhancements of groundwater protection programs may lead to a redefinition of the baseline delineations by the Department of Environmental Conservation.

These baseline delineations apply to public water supply wells. Applicants for new public water supply wells may be required to perform alternative site-specific delineations according to conditions stipulated through the Water Supply Permit Program (refer to Chapter 7).

The proposed WHPA delineations are described according to the following geographic and hydrogeologic settings. They are also summarized in Table 3.1.

- Unconsolidated Aquifers - Upstate New York

1. WHPA Definition:

The boundaries of wellhead protection areas for public water supplies in unconsolidated aquifers in Upstate New York are the land surface boundaries of the aquifers as illustrated on the five-aquifer sheet maps for Upstate published and distributed by the U.S. Geological Survey (see earlier reference). These boundaries may be revised in accordance with more detailed primary and principal aquifer maps and boundary determinations as approved by the Department of Environmental Conservation. The maps provide definition for both unconfined and confined aquifers. Revisions of these boundaries may be made, pending approval by the Department of Environmental Conservation.

2. Rationale:

The delineations proposed above are hydrogeologically-based and are consistent with the policies and goals of the Upstate Groundwater Management Program already adopted and certified by the Governor of New York as an element of the New York State Water Quality Management Plan.

3. Mapping and Case Studies:

Mapping of these areas is already completed and published. Case studies are not considered appropriate, as the maps have been reviewed and approved by the U.S. Geological Survey and the Department of Environmental Conservation as part of the publication process.

4. Public Water Supply Significance:

The large majority of public water supplies using groundwater, particularly for municipal and community systems, are located in unconsolidated aquifers. It is expected that a significant proportion of additional future supplies will also tap these systems.

- Bedrock Aquifers - Upstate New York

1. WHPA Definition:

The baseline boundaries of wellhead protection areas for public water supplies in bedrock aquifers are fixed radius areas with a radius of 1,500 feet from the wellhead. Revisions based on site-specific information are desirable, with the goals being to identify and delineate principal recharge areas. Revisions may be developed, pending approval by the Department of Environmental Conservation.

2. Rationale:

The fixed radius approach for the initial WHPA is not based on estimated times-of-travel or drawdown. It provides a substantial increase in protection over more commonly existing protection zones (typically 100 feet or 200 feet). The principal rationale is that the baseline delineation gives a basis for immediate action on wellfield management without requiring expensive site-specific delineations. Revisions based on local conditions are encouraged, particularly for municipal community systems, of which there are relatively few in the State. The geographic targeting benefits of uniformly delineating substantially larger fixed radius areas for all bedrock wells are very questionable. Many of the bedrock public water supply wells are among the approximately 10,000 non-community public wells (e.g., isolated public buildings, roadside rest areas, etc.). There will be little geographic targeting advantage for groundwater protection programs if numerous 3 to 12 square mile WHPA's (1-2 mile radius) for non-community wells intersect or nearly intersect across the State. It must be recognized that all fresh groundwaters in bedrock aquifers are classified as GA groundwaters and thus are already protected by substantial statewide protection programs which use rigorous ambient water quality standards in their design.

3. Mapping and Case Studies:

Mapping will be performed according to the phasing priorities described in Section 3.3. Case studies of fixed radius approaches are not considered to be of significant benefit. As proposals for revisions based on alternative approaches are submitted to the Department of Environmental Conservation, they will be evaluated for potential use as models for comparable hydrogeologic conditions.

4. Public Water Supply Significance:

Relatively few municipal community systems utilize bedrock aquifers in New York State and those that do are generally with low population dependence. Public water supplies in bedrock aquifers are typically non-community wells serving small numbers of people.

◂ Magothy and Lloyd Aquifers - Long Island

1. WHPA Definition:

The boundaries of the wellhead protection area for public water supplies using the Magothy and Lloyd aquifers are the boundaries of the Deep Flow Recharge Area as recognized by the Department of Environmental Conservation. Refinements within the overall WHPA may include further definition of Wellfield Management Areas, pending approval by the Department of Environmental Conservation.

2. Rationale:

The Deep Flow Recharge Area was determined to be the most important overall groundwater protection area for wells in the Magothy and Lloyd aquifers in the Long Island Groundwater Management Program already adopted and certified by the Governor of New York as an element of the New York State Water Quality Management Program. The delineations have also been adopted in the Suffolk County Sanitary Code.

3. Mapping and Case Studies:

Mapping of the Deep Flow Recharge Area is already completed. Additional case studies are not considered appropriate.

4. Public Water Supply Significance:

Most public water in Nassau County is withdrawn from the Magothy aquifer. The majority of public water supplies in Suffolk County are also withdrawn from the Magothy aquifer. Of those public water supplies in Suffolk County utilizing the Glacial aquifer, approximately half are located within the Deep Flow Recharge Area. Thus, these wells are included within the overall wellhead protection area for the deeper aquifers.

◂ Glacial Aquifer - Long Island

1. WHPA Definition:

The boundaries of the wellhead protection area for public water supplies using the Glacial aquifer are defined as a fixed variable shape zone with a fixed radius in the upgradient groundwater flow direction of 1,500 feet and a fixed radius in the downgradient direction of 500 feet. Revisions may be made, pending approval by the Department of Environmental Conservation.

2. Rationale:

Fixed-shape zones are not based on calculated time-of-travel or drawdown. The proposed definition is consistent with Water Supply Sensitive Areas already delineated by Suffolk County (which contains nearly all of the Glacial wells on Long Island) and for which enhanced protection programs have already been implemented in the Suffolk County Sanitary Code. Approximately half of the Glacial wells are within the Deep Flow Recharge Area and are thus protected within a larger overall WHPA. Significant expansion of the WHPA for all Glacial wells may not provide any reasonable geographic targeting benefits, as most of the WHPA's would intersect or nearly intersect. All fresh groundwaters in the Glacial aquifer are already covered by substantial protection programs which utilize a rigorous set of ambient water quality standards.

3. Mapping and Case Studies:

Mapping of the WHPA's for Glacial wells in Suffolk County has been completed through the Water Supply Sensitive Area delineations. For the relatively few Glacial wells in Nassau County, mapping will be completed according to the phasing priorities described in Section 3.3. Case studies of fixed-shape delineations are not considered to be of significant benefit. As proposals for revisions based on alternative approaches are submitted to the Department of Environmental Conservation, they will be evaluated for potential use as models for other Glacial well delineations.

4. Public Water Supply Significance:

As stated previously, approximately one-fourth of the public water supplies in Suffolk County are based in Glacial wells that are outside of the Deep Flow Recharge Area. If Nassau County is included, only about one-eighth of the water supply dependency is from Glacial wells outside of the Deep Flow Recharge Area.

3.2.5. Remedial Action Areas

For all community public water supply wells, regardless of setting, a remedial action area will be delineated within the WHPA. For those supply wells, the proposed baseline delineation of this area will be a fixed radius zone of 200 feet radius from the well. Revisions may be made after evaluation by the Department of Environmental Conservation. For non-community public water supply wells (e.g., isolated public buildings, etc.), the existing New York State Department of Health standards for well separations (e.g., from waste disposal facilities) are to be followed.

The rationale for this baseline delineation is based upon general observations in the past that such a zone has been adequate for protection against microbiological contamination. An alternative time-of-travel basis for delineating revised remedial action area boundaries would be to use a time-of-travel from a minimum of 60-days up to one year. The 60-day period has been used in New York State and in many European countries (USEPA, EPA 440/6-87-010, Guidelines for Delineation of Wellhead Protection Areas). A one-year period is considered conservative. In certain cases, the site-specific hydrogeology (e.g., confined aquifer conditions or long times-of-travel) and the nature of existing land uses and management options may allow remedial action areas smaller than 200 feet radius.

3.2.6. Potential Refinements and Summary

Table 3.1 summarizes the baseline delineations for wellhead protection areas.

Refinements may include:

- Subdivision of the Wellfield Management Area portion of the WHPA, to allow application of different levels of management within the WHPA.
- Revision of the Remedial Action Area portion of the WHPA, according to alternative methods, including time-of-travel or drawdown analysis.

- Revised boundary determinations of the unconsolidated aquifers in Upstate, including primary and principal aquifers, or of the Deep Flow Recharge Area on Long Island.
- Alternative hydrogeologic determinations of appropriate WHPA's in bedrock aquifers or for wells in the Glacial aquifer on Long Island.

3.3. Phasing Considerations

The published unconsolidated aquifer maps cited in the previous section complete the baseline WHPA delineations for all public water supply wells within those aquifers. The completed delineation of the Deep Flow Recharge Area on Long Island has been defined according to road boundaries. That delineation defines the WHPA for all public water supply wells in the Magothy and Lloyd aquifers. The baseline WHPA boundaries for public water supply wells using the Glacial aquifer in Suffolk County have been determined by the Suffolk County Department of Health Services through its Water Supply Sensitive Area designations.

The remaining baseline WHPA boundary determinations that are needed consist of a relatively small set of Glacial aquifer wells and public water supply wells in bedrock aquifers. The phasing priorities for these groups are, in order:

1. Municipal community wells
2. Non-municipal community wells
3. Non-community public wells

Within each priority group additional phasing may be generally ordered by population dependency with modifications made if there are significant known or suspected threats to the wells.

It is emphasized that the baseline WHPA delineations for the very large majority of public water supply wells (by population served) are completed. The delineations for the remaining bedrock wells and Glacial wells will be performed as resources permit.

3.4. Summary

The baseline wellhead protection area delineations are considered to be completed through the published aquifer maps cited in this chapter. These cover both confined and unconfined aquifers and low- and high-yielding aquifers. The Deep Flow Recharge Area on Long Island has also been delineated. It is noted that the Deep Flow Recharge Area on Long Island also includes many wells using the shallow Glacial aquifer, and thus provides an added layer of protection.

Refinements (i.e., delineation of additional sub-zones of the overall WHPA) have been completed in many areas. However, such refinements are optional. Their evaluation and delineation will be a goal of future efforts in wellhead protection

REFERENCE NO. 14

Merrick Landfill
Site Inspection
11/26/91
Malcolm Pirnie, Inc.

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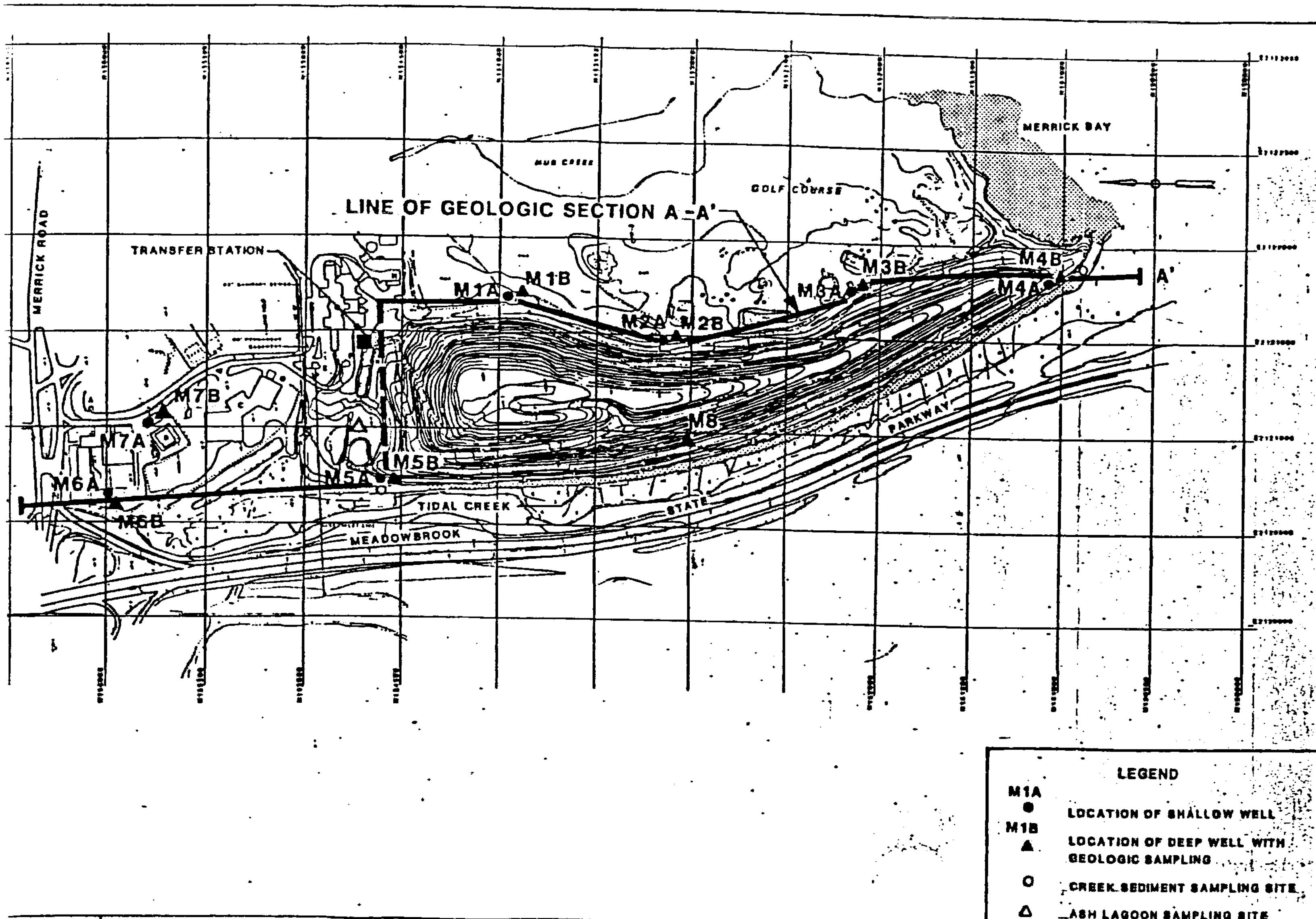


FILL
GATION

0 200 400 600 800
FEET

FIGURE 3-1
SAMPLING SITES

Velzy ASSOCIATES

Site Inspection
Merrick Landfill
Merrick, New York 11/26/91
8002-09-1

Time: 0600: Left Malcolm Pirnie, Inc. (MPI) office.

0830: Arrive at site, meet with Richard Roman Deputy Commissioner

Site Team: Steven T. McNulty
John Reickhoff
Todd Teryek
Weather: Cold, 35°F, wind from the west at 5-15 mph, Sunny w/ Clear Skies

OVA Calibration - Background 0 ppm
EPA ID# 729618 Calibrate to 3.0 Hydrogen

0852 1R-P1 S1 View facing NW of Garbage Piles, located adjacent to the former location of the Ash lagoons

0855 1R-P2 S2 View facing west of the former Ash lagoons (Approx.)

0902 1R-P3 S3 View facing west of the Tidal Creek adjacent to the former Ash lagoon area.

0904 1R-P4 S4 View facing south of the North side of Merrick Landfill. (Notice extensive truck parking Area)

0910 1R-P6 S4 View facing north of the Top of the landfill The two white pipes are test wells.

~~0905~~ 0905 Notice 0.5ppm on OVA meter above Ash lagoons

0912 1R-P6; S6	View facing SE of the Golf Course bordering the landfill
0915 1R-P7: S7	View facing North, Top of landfill, test well located in the picture
0916 1R-P8: S8	View from the Top of the landfill of the entire office complex and Transfer station area.
0918 1R-P9: S9	View facing west of adajacent properties
0922 1R-P10: S10	Second view of print 1R-P10, S10 9 9 on 11/26
0930 1R-P11: S11	View facing North of old incinerator complex.
0932 1R-P12: S12	View facing South of Merrick Bay
0933 1R-P13: S13	Second view of Merrick Bay
0940 1R-P14: S14	View facing North of the Southern tip of the landfill. (Notice Monitoring well #4)
0943 1R-P15: S15	View facing west of Tidal Creek (The mouth of).
0945 1R-P16 S16	View facing South of wetland (marsh) at the southern Tip of the landfill.
0946 1R-P17 S17	View facing North of the western slope of the landfill.
0948 1R-P18 S18	Same as 1R-P17, S17, but the eastern slope of the landfill.
0955 1R-P19 S19	View facing North of eastern slope of the landfill
1003	End of field operations.
1015	Leave Site

REFERENCE NO. 15

GSC-TR8645

GRAPHICAL EXPOSURE MODELING SYSTEM

(GEMS)

USER'S GUIDE

VOLUME 2. MODELING

Prepared for:

U.S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF PESTICIDES AND TOXIC SUBSTANCES
EXPOSURE EVALUATION DIVISION
Task No. 3-2
Contract No. 68023970
Project Officer: Russell Kinerson
Task Manager: Loren Hall

Prepared by:

GENERAL SCIENCES CORPORATION
8401 Corporate Drive
Landover, Maryland 20785

Submitted: December 1, 1986

I

MERRICK LANDFILL
LATITUDE 40:38:45 LONGITUDE 73:33:48 1980 POPULATION

KM	0.00-.400	.400-.810	.810-1.60	1.60-3.20	3.20-4.80	4.80-6.40	SECTOR TOTALS
S 1	0	3029	10450	47428	74177	93691	228775
RING TOTALS	0	3029	10450	47428	74177	93691	228775

I

MERRICK LANDFILL
LATITUDE 40:38:45 LONGITUDE 73:33:48 1980 HOUSING

KM	0.00-.400	.400-.810	.810-1.60	1.60-3.20	3.20-4.80	4.80-6.40	SECTOR TOTALS
S 1	0	906	3300	15336	22546	28594	70682
RING TOTALS	0	906	3300	15336	22546	28594	70682

REFERENCE NO. 16

THOMAS S. GULOTTA
COUNTY EXECUTIVE

GEORGE PICKETT, M.D., M.P.H.
COMMISSIONER

NASSAU COUNTY
DEPARTMENT OF HEALTH
240 OLD COUNTRY ROAD
MINEOLA, N.Y. 11501-4250

November 21, 1991

Mr. Steven McNulty
Malcolm Pirnie, Inc.
197 Route 18, Suite 3000
East Brunswick, N.J. 08816

Re: Merrick Landfill
Merrick, N.Y.

Dear Mr. McNulty:

I am attaching a list of private wells which are in the current monitoring network. The map entries are numbered and correspond to this list. All wells, except for two, are irrigation wells.

As we discussed, this Department does not regulate private wells and therefore does not maintain an inventory of all such wells. The information you requested for each well should be on file with the New York State Department of Conservation at Stony Brook. I am also enclosing the data sheets we have for the wells, but accuracy is limited as the information was provided by the owners.

If you have any further question, please call me at 516-535-5035.

Very truly yours,

Pete Yatsyla

Peter Yatsyla
Public Health Sanitarian
Bureau of Public Water Supply

PY:ld
Encs:

Document # 4342K

Known drinking wells in NCDH monitoring system- 4 miles radius.

1) N-7997 Bellmore Animal Hospital-Sunrise Highway, Bellmore

Non-drinkiing wells in NCDH monitoring system. (Current)

2) N-8008 Newbridge Road Park, Newbridge Rd., Bellmore

3) N-8162 J.F.K. High School, Bellmore Ave., Bellmore

4) N-8171 T.O.H. Golf Course, Clubhouse Dr., Merrick

5) N-7632 Calhoun High School, State St., Merrick

6) N-8153 Mepham High School, Camp Ave., Merrick

7) N-8265 Brookside Junior High School, Meadowbrook Rd., N.Merrick

8) N-8622 Hassett Mercury, Sunrise Highway, Wantagh

9) N-8423 Wantagh High School, Beltagh Ave., Wantagh

10) Various Oceanside School District-All schools have irrigation wells

All non-drinking wells are for irrigation purposes except Hassett Mercury which is for car wash.

Document # 4342K

GROUND WATER MONITORING WORK SHEET
NASSAU COUNTY DEPARTMENT OF HEALTH
BUREAU OF WATER RESOURCES

②

NAME: NEWBRIDGE RD. PARK DATE: 7/19/73

ADDRESS: 2600 NEWBRIDE RD, BELLMORE 11710

PHONE: 826-0522 OWNER:

CONTACT: ~~JOHN E. STOGER~~ TITLE:

N-NUMBER: 8008 ☐ DRINKING ☒ NON-DRINKING: 783-2518

DEPTH: 385 FT ~~826-7400~~ Vignola

AGE: 6 YRS ~~FRANK NICOLLA~~

CAPACITY: 140 GPM

DIAMETER: IN ~~KRAMER~~

PUMP: MAKE:
MODEL NO:
HP: Kelly

DRILLER: PAT KIRBY

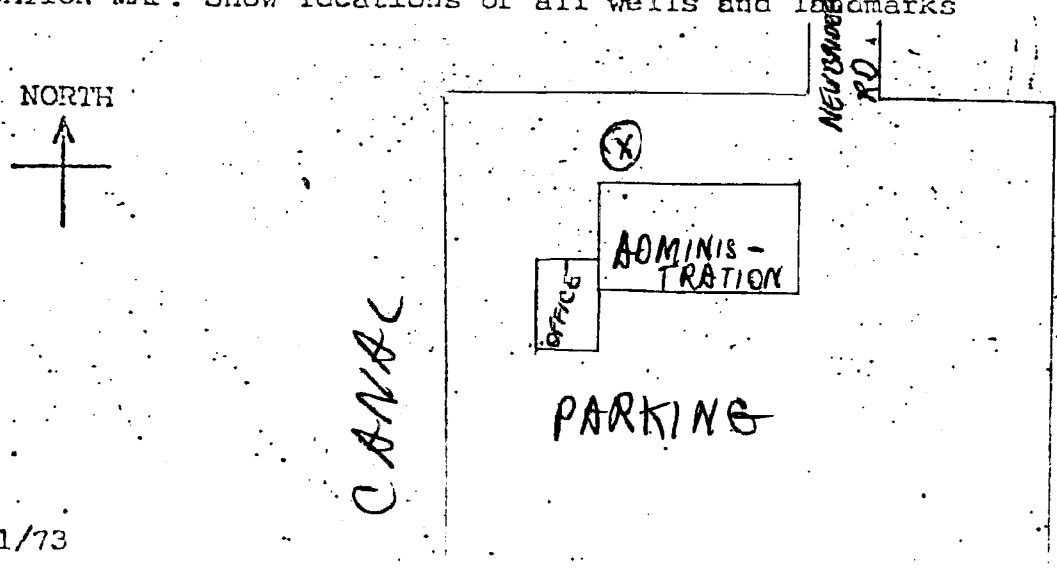
ADDITIONAL DATA:
WELLS ON PREMISES:
IN USE:
ABANDONED:

N-NUMBERS:

CROSS CONNECTIONS: YES

DRINKING WATER SUPPLIER:

LOCATION MAP: Show locations of all wells and landmarks



11/1/73
DHM

NASSAU COUNTY DEPARTMENT OF HEALTH
BUREAU OF WATER RESOURCES

3

NAME: J. F. KENNEDY H.S. DATE: 5/18/73

ADDRESS: BELLMORE AVE, BELLMORE
also: ~~826~~ 623 - 8900 ext. 432

PHONE: 826-2200 EXT. 309 OWNER:

CONTACT: MR. ~~[illegible]~~ NOVAK TITLE: HEAD CUST.

N-NUMBER: 8162 ☐ DRINKING ☒ NON-DRINKING:

DEPTH: 154 FT

AGE: ______ YRS

CAPACITY: 150 GPM

DIAMETER: ______ IN

PUMP: MAKE: ______
MODEL NO: ______
HP: ______

DRILLER: ______

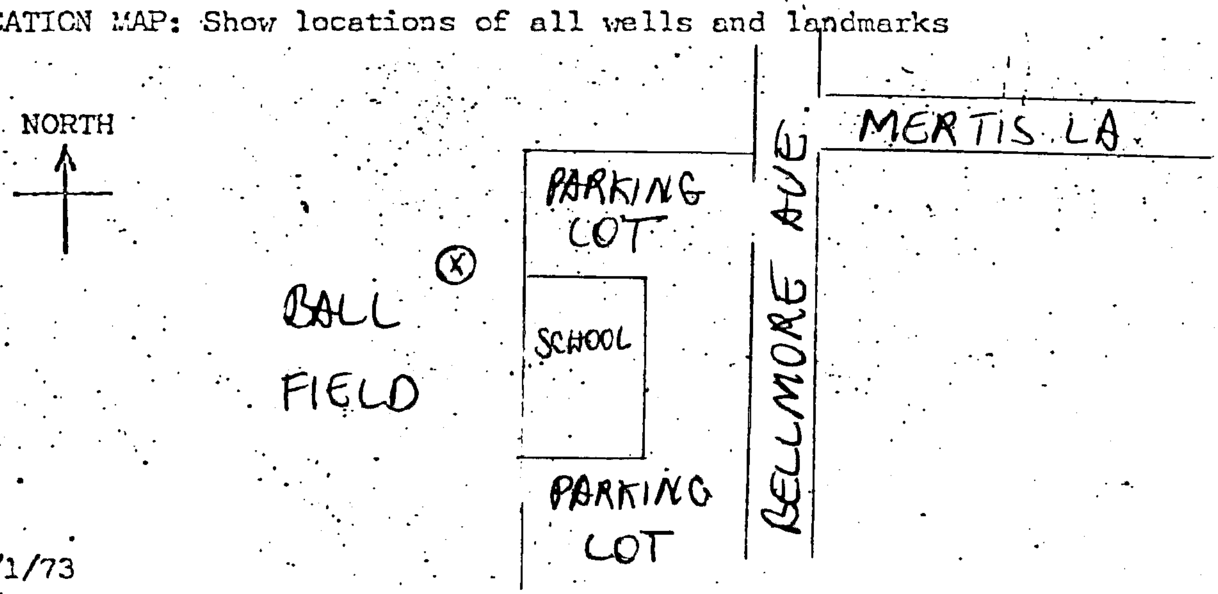
ADDITIONAL DATA:
WELLS ON PREMISES: ______
IN USE: ______
ABANDONED: ______

N-NUMBERS: ______

CROSS CONNECTIONS: ______

DRINKING WATER SUPPLIER: ______

LOCATION MAP: Show locations of all wells and landmarks



11/1/73

GROUND WATER MONITORING WORK SHEET
NASSAU COUNTY DEPARTMENT OF HEALTH
BUREAU OF WATER RESOURCES

(4)

NAME: T.O.H. GOLF COURSE DATE: 9/28/73

ADDRESS: 2550 CLUBHOUSE RD, MERRICK

PHONE: 868-4650 OWNER:

CONTACT: ~~JEFF MILLER~~ TITLE: PARK SUPT

N-NUMBER: 8171 ☐ DRINKING ☒ NON-DRINKING:

DEPTH: 378 FT

AGE: ______ YRS ~~CAPABIANCO~~

CAPACITY: 360 GPM

DIAMETER: ______ IN

PUMP: MAKE:
MODEL NO:
HP:

DRILLER:

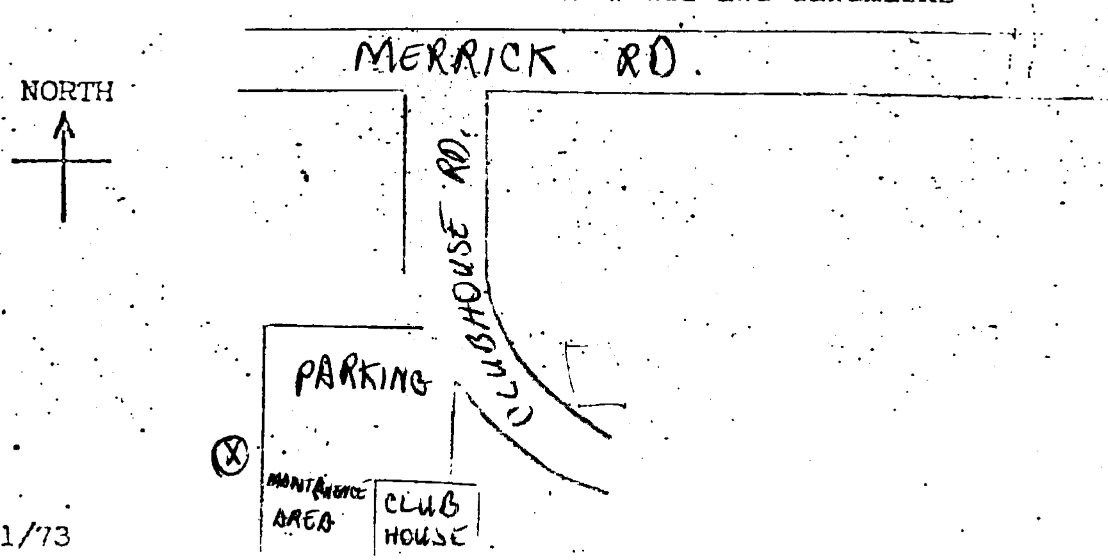
ADDITIONAL DATA:
WELLS ON PREMISES:
IN USE:
ABANDONED:

N-NUMBERS:

CROSS CONNECTIONS:

DRINKING WATER SUPPLIER:

LOCATION MAP: Show locations of all wells and landmarks



11/1/73

NASSAU COUNTY DEPARTMENT OF HEALTH
BUREAU OF WATER RESOURCES

5

NAME: CALHOUN H.S. DATE: 7/17/75

ADDRESS: STATE ST., MERRICK

PHONE: ~~826-2200~~ 623-8900 OWNER:

CONTACT: JOHN EBERT TITLE: H. CUSTODIAN

N-NUMBER: 7632 ☐ DRINKING ☒ NON-DRINKING: IRRIGATION

DEPTH: 65 FT

AGE: ____ YRS

CAPACITY: 100 GPM

DIAMETER: ____ IN

PUMP: MAKE:
MODEL NO:
HP:

DRILLER:

BERNIE WOELL

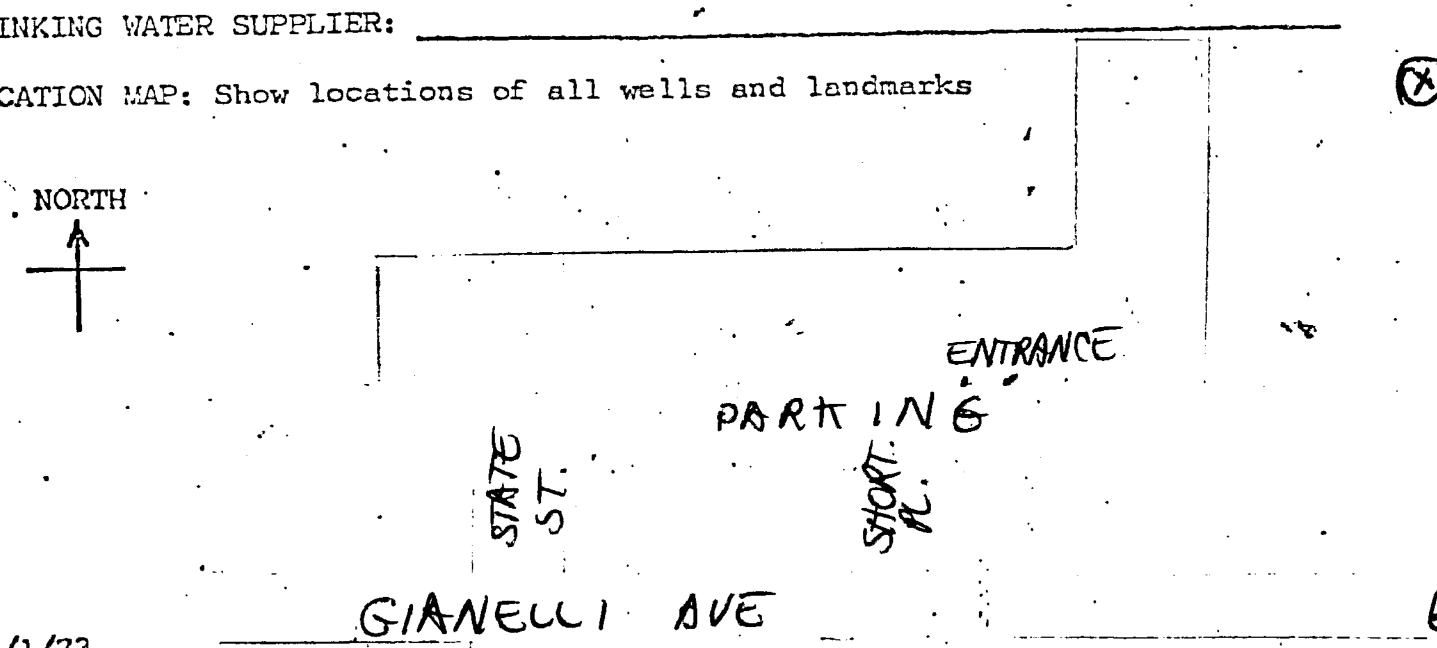
ADDITIONAL DATA:
WELLS ON PREMISES:
IN USE:
ABANDONED:

N-NUMBERS:

CROSS CONNECTIONS:

DRINKING WATER SUPPLIER:

LOCATION MAP: Show locations of all wells and landmarks



6

11/1/73

NASSAU COUNTY DEPARTMENT OF HEALTH
BUREAU OF WATER RESOURCES

(6)

NAME: MEPHAM H.S

DATE: 10/10/73

ADDRESS: CAMP + STEWART AVE, MERRICK 115[illegible]

PHONE: 826-2200

OWNER:

CONTACT: ~~STANLEY~~ CROOKS OR MR. WATTS

TITLE: HEAD CUSTODIAN

N-NUMBER: 8153

☐ DRINKING ☒ NON-DRINKING:

DEPTH: 84 FT

AGE: YRS

CAPACITY: 100 GPM

DIAMETER: IN

CENTRAL H.S
DISTRICT #3

PUMP: MAKE:
MODEL NO:
HP:

DRILLER:

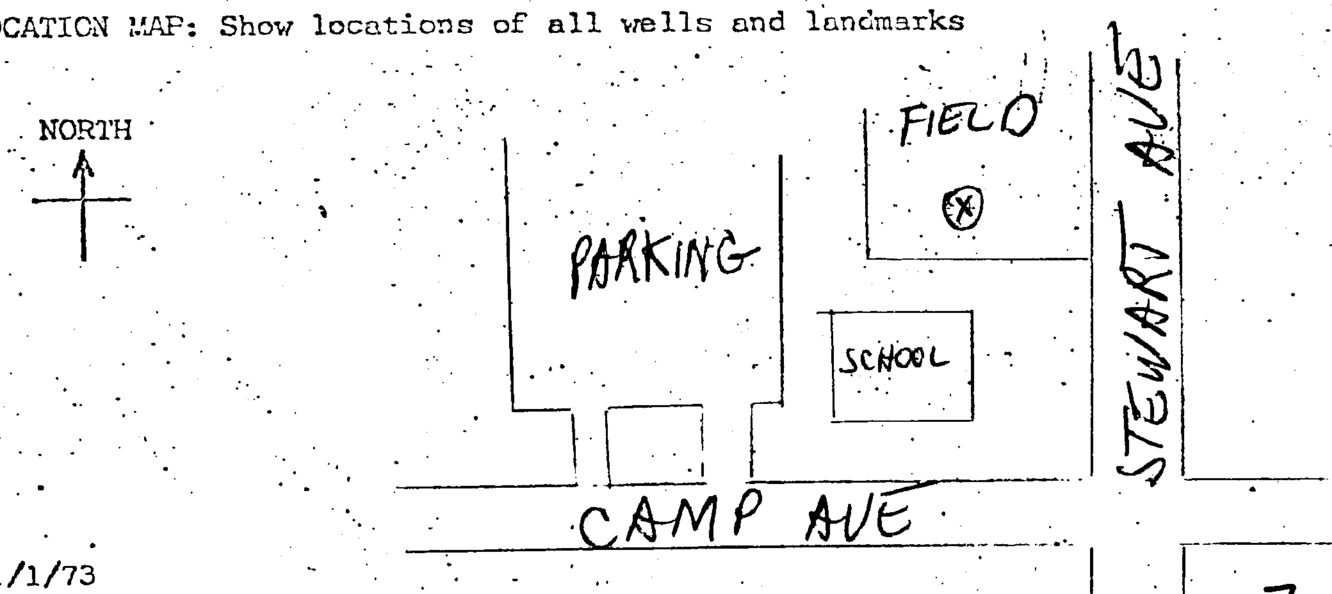
ADDITIONAL DATA:
WELLS ON PREMISES:
IN, USE:
ABANDONED:

N-NUMBERS:

CROSS CONNECTIONS:

DRINKING WATER SUPPLIER:

LOCATION MAP: Show locations of all wells and landmarks



11/1/73
DHM

NASSAU COUNTY DEPARTMENT OF HEALTH
BUREAU OF WATER RESOURCES

7

NAME: BROOKSIDE JR. H.S. DATE: 7/21/75

ADDRESS: MEADOWBROOK RD., N. MERRICK

Me [illegible] BROOKSIDE 623-8900 EXT 434

PHONE: 826-2200 OWNER:

CONTACT: MR. ED FLECKER TITLE: H. CUSTODIAN

N-NUMBER: 8265 ☐ DRINKING ☒ NON-DRINKING: IRRIGATION

DEPTH: ~~75~~ 68 FT

AGE: ______ YRS

CAPACITY: 100 GPM

DIAMETER: ______ IN

PUMP: MAKE:
MODEL NO:
HP:

DRILLER:

ADDITIONAL DATA:
WELLS ON PREMISES:
IN USE:
ABANDONED:

N-NUMBERS:

CROSS CONNECTIONS:

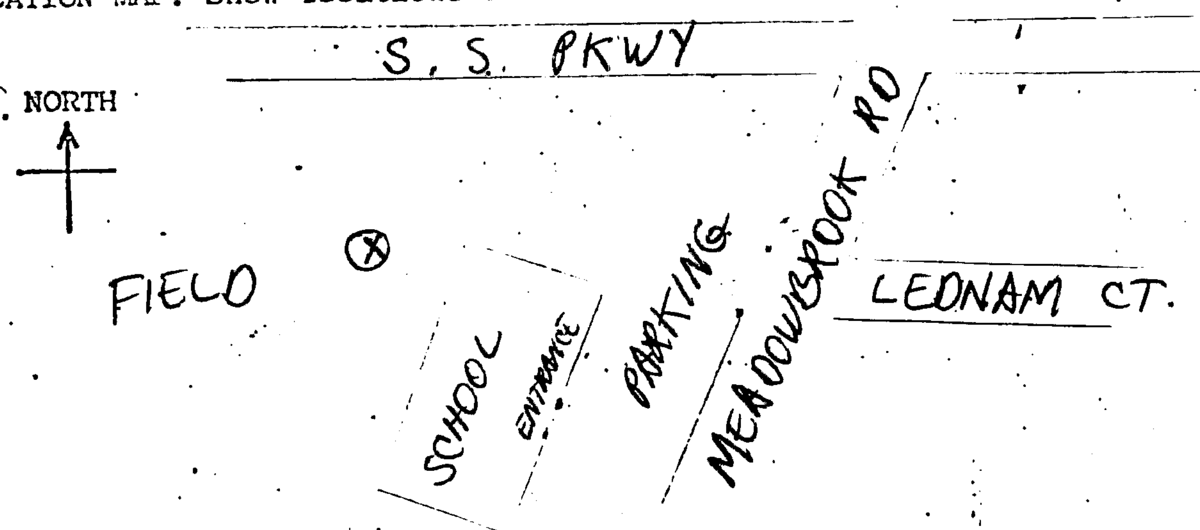
DRINKING WATER SUPPLIER:

Calhoun-623-8900

Mr Wallace
9-22-81

LOCATION MAP: Show locations of all wells and landmarks

NORTH



11/1/73

GROUND WATER MONITORING W SHEET
NASSAU COUNTY DEPARTMENT OF HEALTH
BUREAU OF WATER RESOURCES

(8)

NAME: ~~PRIDE~~ HASSETT MERCURY DATE: 10/26/71

ADDRESS: 3530 SUNRISE HWY, WANTAGH

PHONE: 37857800 OWNER: MIKE REPOLT

CONTACT: TITLE: SERVICE MGR

N-NUMBER: 8622 ☒ DRINKING ☒ NON-DRINKING:

DEPTH: 200 FT

PARTS / SERVICE
HD Richard Lee

AGE: 1970 YRS

CAPACITY: 20 GPM

CAR WASH

DIAMETER: IN

PUMP: MAKE:
MODEL NO:
HP:

DRILLER:

ADDITIONAL DATA:
WELLS ON PREMISES:
IN USE:
ABANDONED:

N-NUMBERS:

CROSS CONNECTIONS:

DRINKING WATER SUPPLIER:

LOCATION MAP: Show locations of all wells and landmarks

NORTH

11/1/73
DHM

NASSAU COUNTY DEPARTMENT OF HEALTH
BUREAU OF WATER RESOURCES

9

NAME: WANTAGH H.S DATE: 6/24/75

ADDRESS: BELTAGH AVE, WANTAGH

PHONE: 781-8000 EXT749 OWNER: ____________________

CONTACT: MR. BIOLSI TITLE: HEAD CUSTODIAN

N-NUMBER: 8487 ☐ DRINKING ☒ NON-DRINKING: IRRIGATION

DEPTH: 49 FT

UFSD #23
W-2496

AGE: ____________ YRS

CAPACITY: 200 GPM

DIAMETER: ____________ IN

PUMP: MAKE: ____________
MODEL NO: ____________
HP: ____________

(SUBMERSIBLE PUMP)

DRILLER: ____________

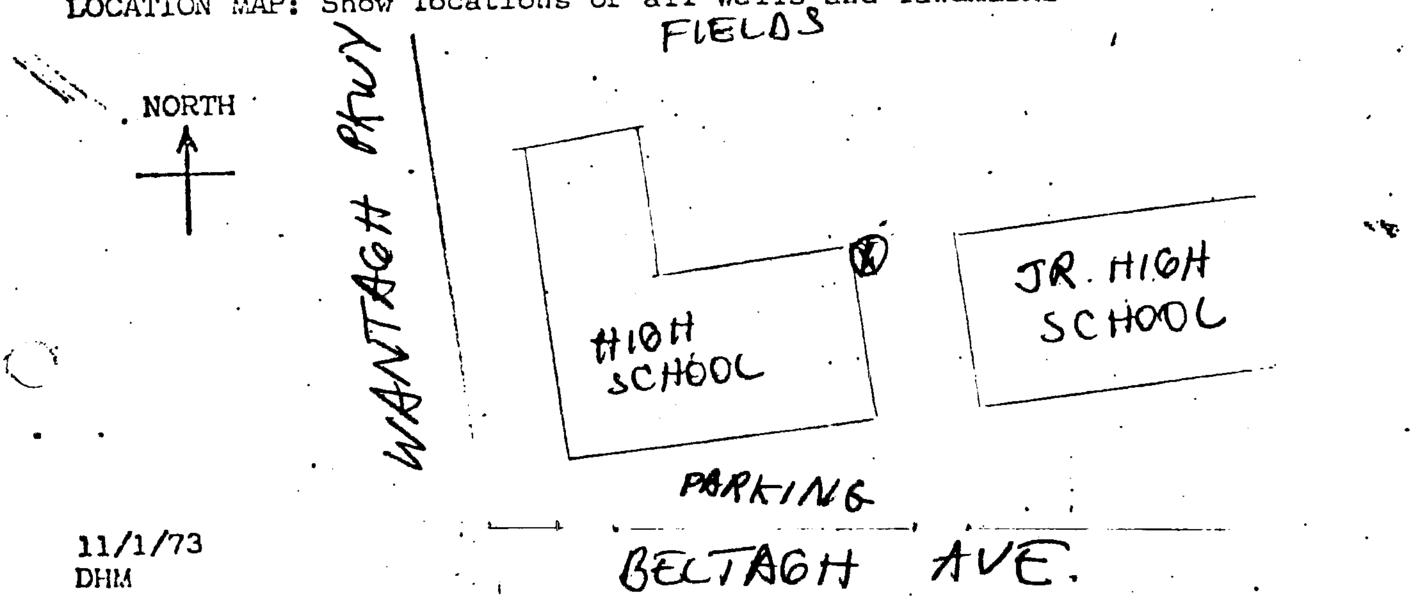
ADDITIONAL DATA: TAP ON WELL.
WELLS ON PREMISES: ____________
IN USE: ____________
ABANDONED: ____________

N-NUMBERS: ____________

CROSS CONNECTIONS: ____________

DRINKING WATER SUPPLIER: ____________

LOCATION MAP: Show locations of all wells and landmarks



11/1/73
DHM

(10)

GROUND WATER MONITORING WORK SHEET
NASSAU COUNTY DEPARTMENT OF HEALTH
BUREAU OF WATER RESOURCES

NAME: OCEANSIDE SCHOOL #5 DATE: 5/28/75

ADDRESS: ~~N. OCEANSIDE RD.~~ Long Beach Rd

PHONE: 678-1459 OWNER:

CONTACT: MR. ~~COOMBS~~ TITLE: SUPT. BLDG & GROUNDS

N-NUMBER: 8774 ☐ DRINKING ☒ NON-DRINKING: IRRIGATION

MR BRUNIE

~~MR COOMBS~~

145 MERLE AVE

DEPTH: 36 FT

AGE: YRS

CAPACITY: 70 GPM

DIAMETER: IN

PUMP: MAKE:
MODEL NO:
HP:

DRILLER:

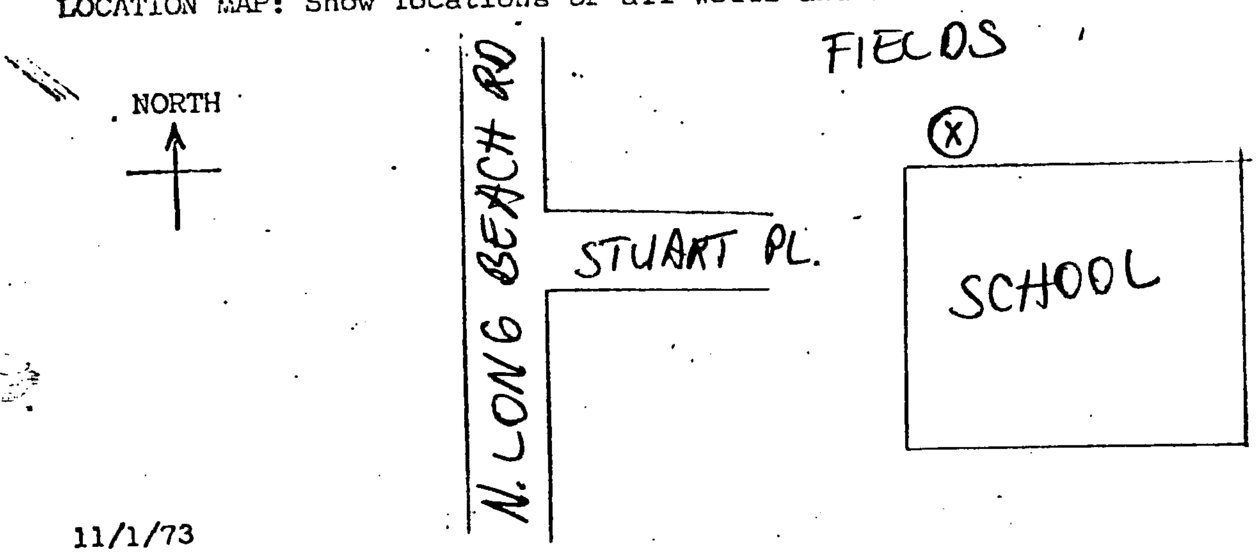
ADDITIONAL DATA:
WELLS ON PREMISES:
IN USE:
ABANDONED:

N-NUMBERS:

CROSS CONNECTIONS:

DRINKING WATER SUPPLIER:

LOCATION MAP: Show locations of all wells and landmarks



11/1/73
DHM

11

GROUND WATER MONITORING WORK SHEET
NASSAU COUNTY DEPARTMENT OF HEALTH
BUREAU OF WATER RESOURCES

(10)

NAME: Oceanside School #6 DATE: 7/6/88

ADDRESS: Long Beach Rd

PHONE: ______ OWNER: ______

CONTACT: ______ TITLE: ______

- -

N-NUMBER: 8482 ☐ DRINKING ☒ NON-DRINKING: ______

DEPTH: ______ FT

AGE: ______ YRS

CAPACITY: ______ GPM

DIAMETER: ______ IN

PUMP: MAKE: ______
MODEL NO: ______
HP: ______

DRILLER: ______

ADDITIONAL DATA:
WELLS ON PREMISES: ______
IN USE: ______
ABANDONED: ______

N-NUMBERS: ______

CROSS CONNECTIONS: ______

DRINKING WATER SUPPLIER: ______

LOCATION MAP: Show locations of all wells and landmarks

11/1/73
DHM

GROUND WATER MONITORING WORK SHEET
NASSAU COUNTY DEPARTMENT OF HEALTH
BUREAU OF WATER RESOURCES

10

NAME: OCEANSIDE SCHOOL #2 DATE: 5/28/75

ADDRESS: SKILLMAN AVE

PHONE: 678-1459 OWNER: ______

CONTACT: MR. COOMBS TITLE: SUPT. BLDG + GROUNDS

N-NUMBER: 8627 ☐ DRINKING ☒ NON-DRINKING: IRRIGATION

DEPTH: 84 FT

AGE: ______ YRS

CAPACITY: 250 GPM

DIAMETER: ______ IN

PUMP: MAKE: ______
MODEL NO: ______
HP: ______

DRILLER: ______

MR COOMBS
145 MERLE AVE

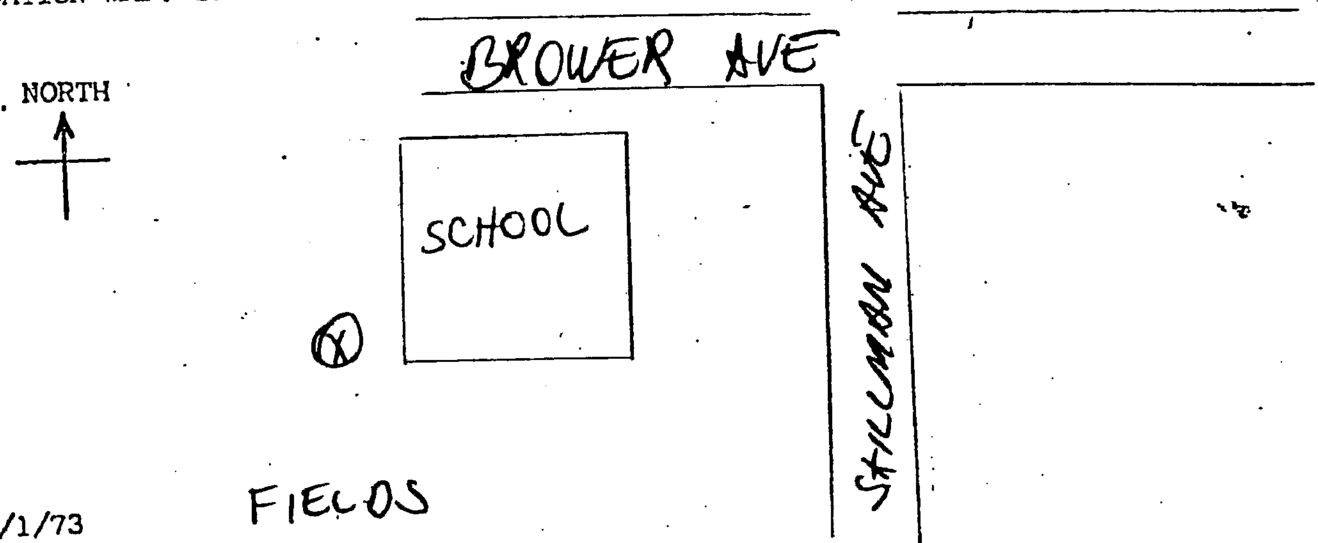
ADDITIONAL DATA:
WELLS ON PREMISES: ______
IN USE: ______
ABANDONED: ______

N-NUMBERS: ______

CROSS CONNECTIONS: ______

DRINKING WATER SUPPLIER: ______

LOCATION MAP: Show locations of all wells and landmarks



11/1/73
DHM

GROUND WATER MONITORING WORK SHEET
NASSAU COUNTY DEPARTMENT OF HEALTH
BUREAU OF WATER RESOURCES

(10)

OCEANSIDE SCHOOL #9

NAME: BOARDMAN JR. H.S. #9 DATE: 5/28/75

ADDRESS: ALICE AVE, OCEANSIDE

PHONE: 678-1459 OWNER: ______

CONTACT: MR. COOMBS TITLE: SUPT. BLDG. & GROUNDS

- -

N-NUMBER: 8775 ☐ DRINKING ☒ NON-DRINKING: IRRIGATION

DEPTH: 130 FT

AGE: ______ YRS

MR COOMBS
145 MERLE AVE

CAPACITY: 200 GPM

DIAMETER: ______ IN

PUMP: MAKE: ______
MODEL NO: ______
HP: ______

DRILLER: ______

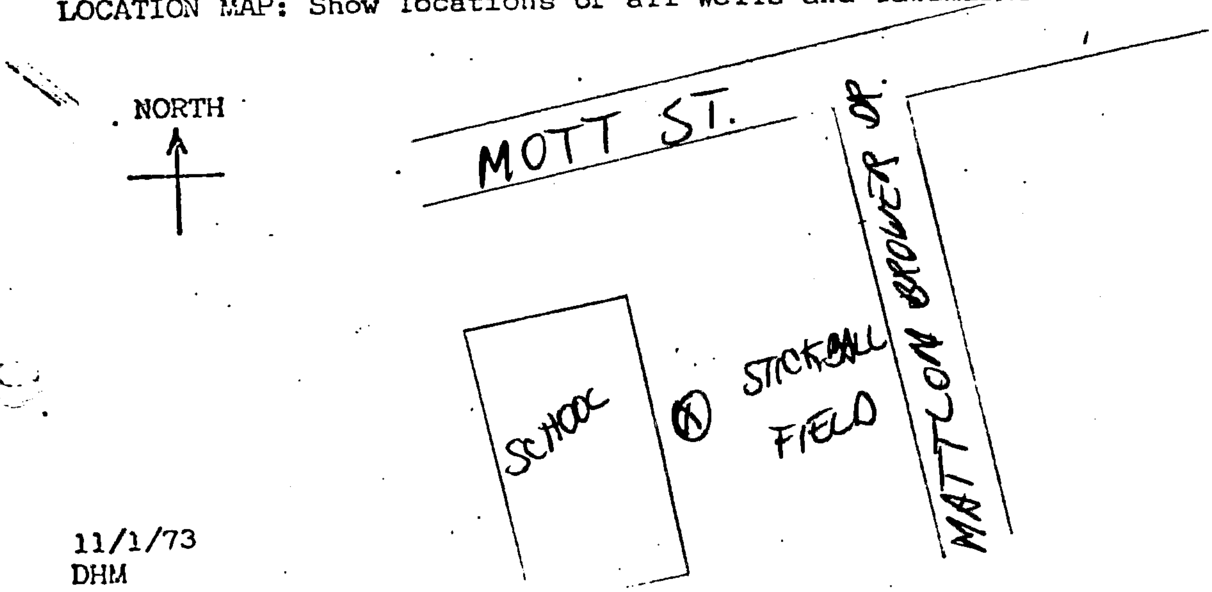
ADDITIONAL DATA:
WELLS ON PREMISES: ______
IN USE: ______
ABANDONED: ______

N-NUMBERS: ______

CROSS CONNECTIONS: ______

DRINKING WATER SUPPLIER: ______

LOCATION MAP: Show locations of all wells and landmarks



11/1/73
DHM

REFERENCE NO. 17

NEW YORK WATER SERVICE CORPORATION
60 BROOKLYN AVENUE, MERRICK, NEW YORK 11566-3402 (516)378-3922

November 18, 1991

Steven T. McNulty
Malcom Pirnie, Inc.
2 Corporate Park Drv
Box 751
White Plains, NY 10602

Mr. McNulty:

Attached is our small scale map showing the location of our existing and potential Well pumping stations. Existing Well stations are in red; potential stations are indicated in green.

I am also enclosing the PSC sheet from our Annual report which indicates some of the Well data you may need.

If you have any questions I can be reached at 516-378-3922.

Very truly yours,

Carl A. Edstrom
District Manager & Chief Engineer

CAE/msm

SOURCES OF GROUND WATER SUPPLY

1. Show the requested information concerning ground water supply. In column (b) indicate whether supply is from springs, wells, or infiltration galleries. Columns (f) to (l) relate to wells only, but other columns should also be filled out in respect of this source of supply.

2. If any property was held at the end of the year under any title other than full ownership, state that fact in a footnote, and give full particulars concerning respondent's title.

3. In column (l) indicate whether Natural flow, Suction, Air lift, or Deep well pump.

Line No.	Location (city, village, or town) and designation of system (a)	Type of development (b)	Year of Construction (c)	Number of each type (d)	Elevation ground surface, ft.* (e)	Wells: Type (driven, dug, etc.) (f)	Depth ft. (g)	Minimum diameter of well In. (h)	Depth water below surface not operating ft (i)	Draw down: Below static, ft. (j)	Draw down: Pumping at G.P.M. (k)	Method of Operation (l)	Average daily yield, thousand gals. (m)
1	Merrick												
2	Jefferson #11	Well	1963	1	22.89	Gravel	649	16	10.00	35.00	1333	Deep Well	(335) 504
3	#12	" **(1984)	1967	1	22.63	Gravel	602	18	11.75	8.75	1000	Deep Well	(203) 256
4	Charles St. # 2	Well	1983	1	30.55	Gravel	570	20	9.00	35.00	1684	Deep Well	(108) 710
5	No. Bellmore												
6	Newbridge Rd. # 1	" *(1987)	1952	1	38.00	Driven	350	14	11.89	47.00	-0-	Deep Well	(-0-) -0-
7	Newbridge Rd. # 3	"	1979	1	39.00	Gravel	700	16	9.83	74.00	1903	Deep Well	(132) 1407
8	Newbridge Rd. # 4	"	1982	1	41.18	Gravel	664	20	23.00	38.00	2040	Deep Well	(318) 1377
9	Wantagh												
10	Old Mill Rd. # 1	Well	1967	1	27.00	Gravel	513	18	5.50	32.50	1671	Deep Well	(237) 3026
11	Jerusalem Ave. # 4	Well	1980	1	34.57	Gravel	660	20	15.00	81.00	1486	Deep Well	(325) 1088
12	Jerusalem # 5	Well	1985	1	34.57	Gravel	583	20	8.00	65.60	2452	Deep Well	(267) 2447
	DeMott Ave. # 4	" *(1980)	1956	1	33.87	Gravel	387	16	12.00	77.40	1656	Deep Well	(239) 390
	DeMott Ave. # 5	Well	1972	1	29.50	Gravel	680	10	12.00	50.00	952	Deep Well	(92) 236
	DeMott Ave. # 6	Well	1983	1	31.30	Gravel	774	20	12.00	39.00	1333	Deep Well	(342) 1493
	Levittown												
	Seaman Nk. Rd. # 2	Well	1952	1	62.00	Gravel	151	16	30.00	31.20	-0-	Deep Well	(-0-) -0-
	Seaman Nk. Rd. # 3	" *(1984)	1969	1	60.00	Gravel	655	20	24.42	34.70	1666	Deep Well	(182) 1934
	Seaman Nk. Rd. # 4	Well	1979	1	69.00	Gravel	649	20	29.00	29.00	1666	Deep Well	(339) 2181
	Massapequa												
	Sunrise Mall # 6	Well	1963	1	26.67	Gravel	533	16	15.50	56.50	1667	Deep Well	(203) 1228
	Sunrise Mall # 7	" *(1984)	1971	1	26.50	Gravel	892	20	15.00	76.00	1666	Deep Well	(278) 1004
	Sunrise Mall # 8	Well	1988	1	30.33	Gravel	684	20	15.20	43.00	1171	Deep Well	(292) 1285

NOTES:
1 - Figure in parenthesis ( ) represents number of Days Ran on which average is calculated.
2 - Massapequa Well #7 land is owned by Hudson Resources Inc., a subsidiary of N.Y.W.S.
* Indicates New 14" Casing. Year Shown in ()
** Indicates New 8" screen and riser. Year Shown ()
3 - Newbridge Road Well #2 is a capped well. It can be used as an observation well. (not filled in)

ARCS II CONTRACT 68-W9-0051
MALCOLM PIRNIE, INC.
RECORD OF TELEPHONE CONVERSATION/AGREEMENT

File No.

Date: 12/6/91 Time: 815 [x] AM; [] PM

[] Incoming Call From: Telephone No.

Affiliation:

[x] Outgoing Call To: Mr. Carl A. Edstrom 1-516-378-3922 Telephone No.

Affiliation:

Malcolm Pirnie Staff: Steven T. McNulty 1-908-214-2637
(Receiving or Calling) Name Telephone No.

SUMMARY OF [x] CONVERSATION [] AGREEMENT:

Mr. Edstrom informed me, that approximately 39000 homes and businesses are served on the blended well system provided by the New York Water Corporation.

Follow-up Action:
(Specify)

Action By:
Name Action Due Date

Copy to:

[] Continued


Area North of this line see Map 31C10A NORTH
31C10A-
N
For Massapequa Area see Map 31C11
BROOKSIDE JUNIOR H.S.
CALHOUN SCHOOL
MERRICK AVE JUNIOR H.S.
NORTH MERRICK
WANTAGH JR & SR HIGH SCHOOL
SEAFORD H.S.
SEAFORD JUNIOR H.S.
SUNRISE HIGHWAY
BELLMORE
PARK
MERRICK BAY
HEMPSTEAD BAY
EAST BAY
FLAT CREEK
OLIVERS ISLAND
SEAMAN'S ISLAND
LEGEND
HYDRANTS
VALVES
SCALE
NOTES:
REVISIONS
APPROVED:
CHIEF ENGINEER, N.Y.W.S.CORP
N.Y.PROF ENG'RS.LIC NO.13004
31C10A-
NEW YORK WATER SERVICE CORP.
MERRICK PLANT
MAP OF
DISTRIBUTION SYSTEM
MERRICK - NORTH MERRICK
BELLMORE - NORTH BELLMORE
WANTAGH - SEAFORD
(TOWN OF HEMPSTEAD)
NEW YORK WATER SERVICE CORPORATION
CHECKED BY
SCALE: SHOWN
31C10A-110
REVISIONS
NEW YORK WATER SERVICE CORP.
MERRICK PLANT
MAP OF
DISTRIBUTION SYSTEM
IN THE SOUTHERLY PART OF
MERRICK - BELLMORE
WANTAGH - SEAFORD
(TOWN OF HEMPSTEAD)
NEW YORK WATER SERVICE CORPORATION
31C10B-110
SIZE: 24 x 34

REFERENCE NO. 18

VILLAGE OF ROCKVILLE CENTRE

P. O. BOX 950
ROCKVILLE CENTRE, N. Y. 11571-0950

ELECTRIC AND WATER DEPTS. - VILLAGE OF ROCKVILLE CENTRE, NY - CIRCA 1898

RICHARD W. TOBIN
ASST. SUPERINTENDENT OF UTILITIES
516/766-0300
FAX #: 516/766-3366

November 14, 1991

Mr. Steven T. McNulty
Malcolm Pirnie Inc.
197 Route 18
East Brunswick, NJ 08816

Dear Mr. McNulty:

Enclosed please find the information you requested.

If I can be of further assistance, please do not hesitate to call me at 516-766-0300, extension 252.

Very truly yours,

Karl W. Dahlem

KARL W. DAHLEM
Chief of Operations

KWD:mw
Encl.

PRIVATE WELLS

STUART PLACE 35
MERRICK RD 393
RUTLAND AVE. 26
PURDY CT 33, 41
CUMBERLAND ST. 74
CONCORD ST. 60
BROWER AVE 177, 331
GATEWAY 15
WINDING RD. 37, 46
LAKEVIEW AVE 146, 327, 552, 651, 661
665, 676
KNOLLWOOD RD. 47
SEAMAN AVE. 152, 164, 169, 179, 183,
188, 194, 206, 212, 227
KENNEDY AVE. 33, 40, 95, 100
RAYMOND ST. 314, 337, 470
SALEM RD. 36, 66, 74
MARLBOROUGHT CT 2, 4, 5, 6, 8
DE MOTT AVE 128, 153, 162, 260, 280
EARLE AVE. 25
PRINCETON RD. 294, 308, 360
MUIRFIELD RD. 100, 171, 175
FONDA RD 122
BROWER AVE. 177, 331
NO. LONG BEACH RD 239, 264, 288, 342
STRATFORD RD. 12
HAMILTON ST 134
WHITEHALL RD. 3

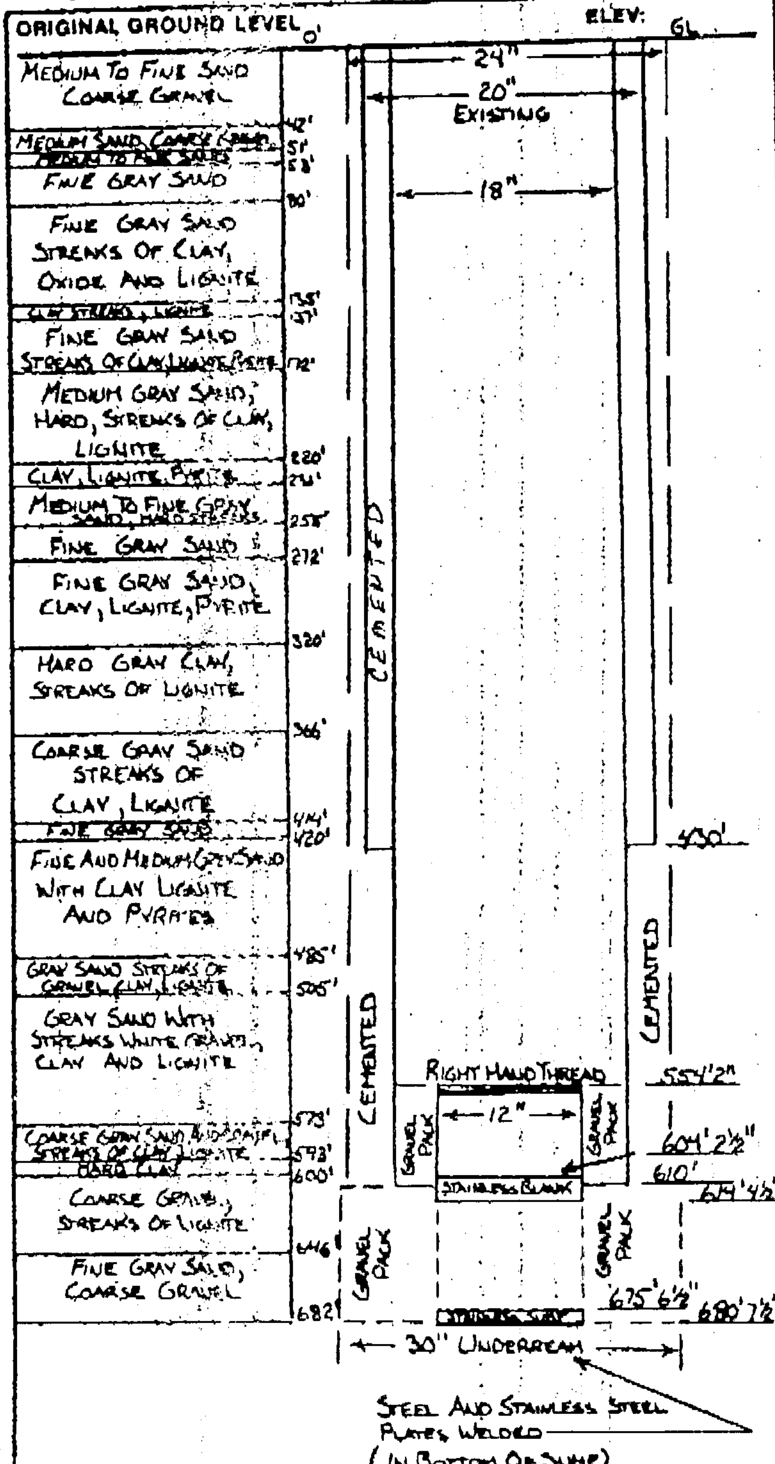
TOTAL 67 PRIVATE WELLS

(2) TWO WELLS THAT SUPPLY THE PUBLIC
WELL #11 N8216 - DEPTH OF CASING 665'
DEPTH OF PUMP 85'5"
WELL #12 N8217 - DEPTH OF CASING 675'6"
DEPTH OF PUMP 94'9"

APPROX ± 2,000 ACTIVE HOUSE SERVICES

NOV-13-91 WED 11:11

Smith



MATERIAL

PIPE
430' OF EXISTING 20" BY .375 WALL BLACK STEEL PIPE, WELDED
610' OF 18" BY .375 WALL BLACK STEEL PIPE, WELDED
50' OF 12" BY .375 WALL BLACK STEEL PIPE, WELDED
15' OF 12" 316 STAINLESS STEEL BLANK, WELDED

SCREEN 60' OF 12" JOHNSON 316 STAINLESS STEEL WIRE WRAP WITH #60 SLOT OPENINGS

PLUG STEEL AND STAINLESS STEEL PLATES, WELDED

GRAVEL 24.5 TONS OF #2 AND #1 MORIE

SEAL 30 TONS OF CEMENT

PUMP

SIZE 15" LAYNE	NUMBER 56537
STAGES 3	TYPE DRLC
SETTING 94'9" TO S.F.	COLUMN 10" FLGD.
TUBING 3"	SHAFTING 1 15/16"
BOWLS CAST IRON ENAM.	IMPELLERS BRONZE
IMP. SHAFT STAINLESS STEEL	SUCTION
STRAINER NONE	PRESS B P
HEAD TF 1025	AIR LINE 94'6" FROM B.P.

MOTOR

MAKE GE	TYPE K
VOLTS 230/460	CYCLE 60
PHASE 3	AMP 346/173
H.P 150	RPM 1770
FRAME B444TP20	NON REV
MODEL 5K6277XH715A	SERIAL NO CK5313177
UPPER BRG	LOWER BRG

GEAR DRIVE

MFG	MODEL
RATIO	SERIAL NO
HVY THRUST	NON REV

ENGINE

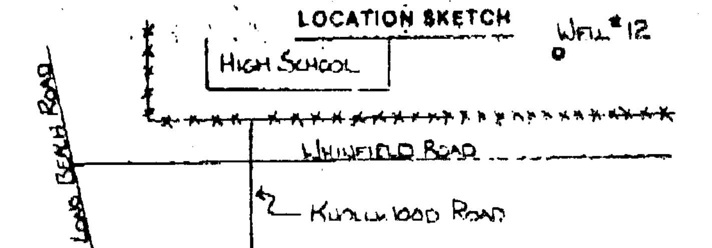
MFG	MODEL
PRM	CONTINUOUS H P
FUEL	SERIAL NO

WELL

STARTED 6-5-84	CLEAR DEPTH 680' 7½"
FIRST TEST 3-26-85	METHOD REVERSE ROTARY
FINAL TEST 4-11-85	GUAR. CAP
ACCEPTED	GUAR. PRESS
B.P. ELEV	FORMATION MAGOTHY
DIST. TO G.W. 560'	DRILLER D. CROCKER, B. WIRSHUP

DATE	4-11-85				
STATIC LEVEL	25'6"				
PRODUCTION	1205 GPM				
PUMP. LEVEL	50'3"				
WATER TEMP					

LOCATION SKETCH



HYDRO GROUP

VILLAGE OF ROCKVILLE CENTRE
KNOLLWOOD RD, ROCKVILLE CENTRE, N.Y.

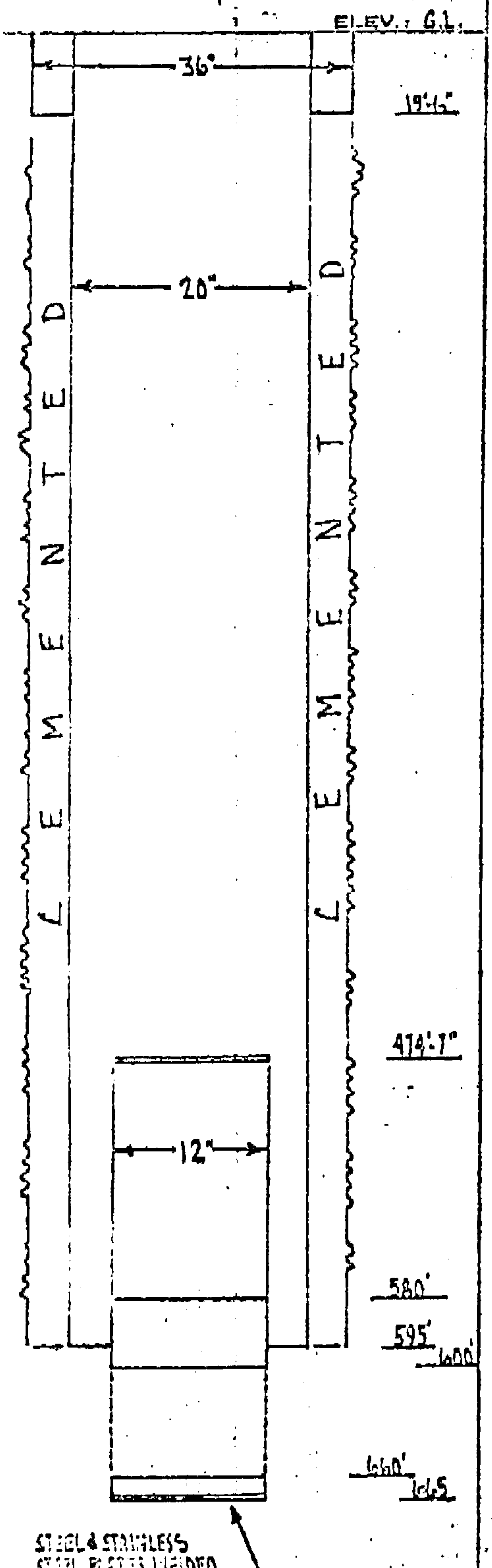
LAYNE WELL & PUMP DIVISION

DRAWN BY KMB
LAYNE WELL # 10

STATE # N-8217
CUSTOMER WELL # 12 REDRILL

3

ORIGINAL GROUND LEVEL	0'
TOP SOIL	2'
BROWN SAND, CLAY	10'
CLAY	11'
FI. BRN. SAND GRAV.	19'
SAND GRAV. STREAKS	45'
SAND, GRAVEL CLAY STREAKS	93'
F.? SAND GR. OXIDS	99'
BLK. SANDY CL. LIGN.	101'
FINE & COAR. SAND	103'
BLK. GR. CLAY. LIGN.	116'
SAND CLAY LIGNITE	127'
BRN. CLAY-LIGN. PYR.	160'
BROWN CLAY - PYRITES - SANDY CLAY	192'
FINE GRAY SAND STREAKS OF CLAY, LIGNITE PYRITES	322'
GREY CLAY	335'
FINE & COARSE SAND STREAKS CLAY, LIGNITE PYRITES	432'
FI. COAR. SAND & G	442'
CLAY LIG. PYR. SA.	452'
SAND GRAVEL CLAY STREAKS	502'
SANDY CLAY	507'
FINE AND COARSE SAND - STREAKS CLAY, LIGNITE SANDY CLAY	585'
CLAY	595'
SAND GRAVEL CLAY & LIGNITE	665'



rec wfc 7/1/65

MATERIAL

PIPE: 19'-6" of 36" DIAM x 1/2" WALL BLACK STEEL PIPE WELDED
597'-6" of 20" DIAM x 3/8" WALL BLACK STEEL PIPE WELDED
105'-5" of 12" DIAM x 45LB./FT BLACK STEEL PIPE T&C
25' of 12" DIAM x 7-GA. 18-8 TYPE 304 STAINLESS STEEL PIPE

SCREEN: 60' of 12" DIAM x 7-GA 18-8 TYPE 304 STAINLESS No. 6 SLOT

PLUG: 3/4" STEEL & 7-GA STAINLESS STEEL PLATES WELDED
GRAVEL: 93,000 LBS OF 3-W
SEAL:

PUMP

SIZE	15"	NUMBER	56904
STAGES	3	TYPE	DRLC
SETTING	74'-7" TO SF.	COLUMN	10" & 10' FLGD. C.L.
TUBING	3"	SHAFTING	1 5/16"
BOWLS	CAST IRON ENAMELLED	IMPELLERS	BRONZE
IMP. SHAFT	18-8, 303 STAINLESS	SUCTION	10' of 10"
STRAINER	NONE	PRESS. B.P.	
HEAD	TF-1025	AIR LINE	84'-1" BP.

MOTOR

MAKE	G.E.	TYPE	K
VOLTS	460	CYCLE	60
PHASE	3	AMP.	144
H. P.	125	RPM	1770
FRAME	B405TP20	NON REV.	YES
MODEL	VHS-5K6268XH3A	SERIAL No.	ECJ531155
UPPER BRG.	629A1226L	LOWER BRG.	5903493P16

GEAR DRIVE

MFG.		MODEL	
RATIO		SERIAL No.	
HVY. THRUST		NON-REV.	

ENGINE

MFG.		MODEL	
RPM		CONTINUOUS H. P.	
FUEL		SERIAL No.	

WELL

STARTED	1-23-67	CLEAR DEPTH	665' GL.
FIRST TEST	3-28-67	METHOD	REVERSE ROTARY
FINAL TEST		GUAR. CAP.	1500
ACCEPTED		GUAR. PRESS.	
B. P. ELEV.		FORMATION	MAGOTHY
DIST. TO G.W.	480' G.L.	DRILLER	C. BOYER

DATE	3-28-67				
STATIC LEV.	23'				
PRODUCTION	1758				
PUMP. LEVEL	55'				
WATER TEMP.					

LOCATION SKETCH

LAYNE-NEW YORK CO., INC. - LINDEN, N. J.
WATER SUPPLY CONTRACTORS

VILLAGE of ROCKVILLE CENTER - KNOLLWOOD RD, S2 SIDE HIGH SC.

DRAWN BY N.M. 9
STATE # N-[illegible]
11 4

ARCS II CONTRACT 68-W9-0051
MALCOLM PIRNIE, INC.
RECORD OF TELEPHONE CONVERSATION/AGREEMENT

File No. ____________
Date: 12/6/91 Time: 800 [X] AM; [] PM

[] Incoming Call From: ____________ Telephone No.
Affiliation: ____________

[X] Outgoing Call To: Karl Dahlem 1-516-766-0300 Ext. 252
Telephone No.
Affiliation: Village of Rockville Centre

Malcolm Pirnie Staff: Steven T. McNulty 1-908-214-2637
(Receiving or Calling) Name Telephone No.

SUMMARY OF [X] CONVERSATION [] AGREEMENT:

Mr. Dahlem informed me that the location of the two public supply wells, listed in the information delivered, is behind the South Side High School. The school is located on Shepard St. in the Village of Rockville Centre.

Follow-up Action: ____________
(Specify)

Action By: ____________
Name Action Due Date
Copy to: ____________

[] Continued

5

REFERENCE NO. 19

VILLAGE OF FREEPORT
WATER DEPT

1) a distribution map is enclosed that shows the location of our Northeast Wellfield - (4 wells) 0.5 Million Gallon Storage tank adjacent to Meadowbrook Parkway & Lakeview Avenue

also, the Northwest Wellfield (4 wells) at North Longbeach Avenue and Sunrise Highway. 1.0 MILLION GALLON Storage Tank.

The Northeast Wellfield is approx 1 1/2 miles North of the Merrick Landfill.

The Northwest Wellfield is approx 1 3/4 miles Northwest of the Merrick Land Fill.

WELLS (NORTHEAST WELLFIELD)

1A -	N 7796	DEPTH	590'	MAGOTHY
3 -	N133	DEPTH	529'	"
4 -	N134	DEPTH	525'	"
8 -	N5696	DEPTH	523'	"

WELLS NORTH WEST WELLFIELD

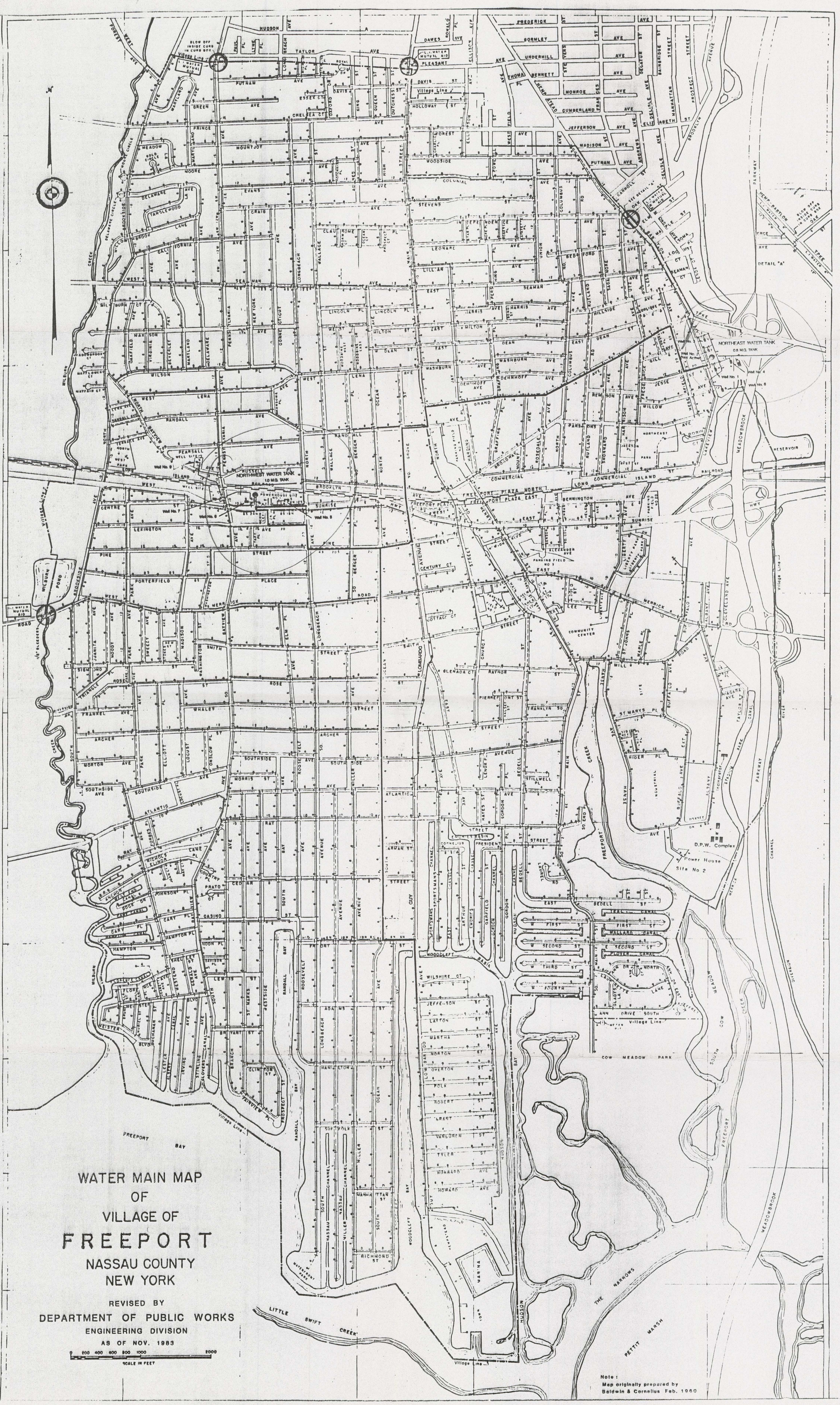
5	N-68	DEPTH	509'	"
6	N-69	DEPTH	501'	"
7	N5695	DEPTH	529'	"
9	N8637	DEPTH	640'	"

2) 125 Miles of Main – 4" thru 24"
10,000 active Services.

516-378-5069

JOHN L. BRYCK
SUPERVISOR
WATER & SEWER SERVICES

DEPARTMENT OF PUBLIC WORKS
INC. VILLAGE OF FREEPORT
46 NO. OCEAN AVENUE
FREEPORT, N. Y. 11520



WATER MAIN MAP OF VILLAGE OF FREEPORT

NASSAU COUNTY
NEW YORK

REVISED BY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION
AS OF NOV. 1983

0 200 400 600 800 1000 2000
SCALE IN FEET

REFERENCE NO. 20

LONG ISLAND WATER CORPORATION
733 SUNRISE HIGHWAY, LYNBROOK, NEW YORK 11563 • (516) 593-1000

November 26, 1991

Mr. Steven T. McNulty
Malcolm Pirnie, Inc.
2 Corporate Park Drive
Box 751
White Plains, NY 10602

Re: **Merrick Landfill**
Site Inspection Process
(Your EPA Contract #68-W9-0051)

Dear Mr. McNulty:

The following Long Island Water Corporation wells are located within the four mile radius indicated on your Plate 1:

Site	Well	Location	Depth of Screen (ft.)	Referen. Elevatn.
1	1-13	Whitehouse & Pennsylvania, Roosevelt	530-610	44.73
1	1-15	" " "	61-81	42.07
1	1-16	" " "	63.5-95	43.68
1	1-17	" " "	500-560	43.03
16	16-1	Decatur S/O Washington, Roosevelt	445-497	37.50
4	4-16	Seaman E/O Voshage, Baldwin	460.5-500.5	20.83
4	4-17	" " " "	560-620	27.67
4	4-1-15	" " " "	20-35	25 +/-
12	12-1	Grove S/O Seaman, Baldwin	541-611	21.27
12	12-2	" " " "	263.5-318.5	21.47
22	22-1	Dartmouth N/O DeMott, Baldwin	518-588	42.17

Notes

- All of the above wells except 4-1-15 are Magothy
- Wells 4-1-15 consists of fifteen (15) Upper Glacial wells each with 10' of screen. Depths shown are the approximate depths to the top of the highest screen and bottom of the lowest screen. These wells are not normally used.

Mr. Steven T. McNulty
November 26, 1991
Page Two

Water pumped from the listed wells can be delivered to any of our 72,390 active services (as of 10/31/91), serving approximately 234,000 people.

As we discussed, I am enclosing one copy each of our distribution plat and drillers logs from wells 4-17 and 22-1.

We trust this data will be satisfactory.

Very truly yours,

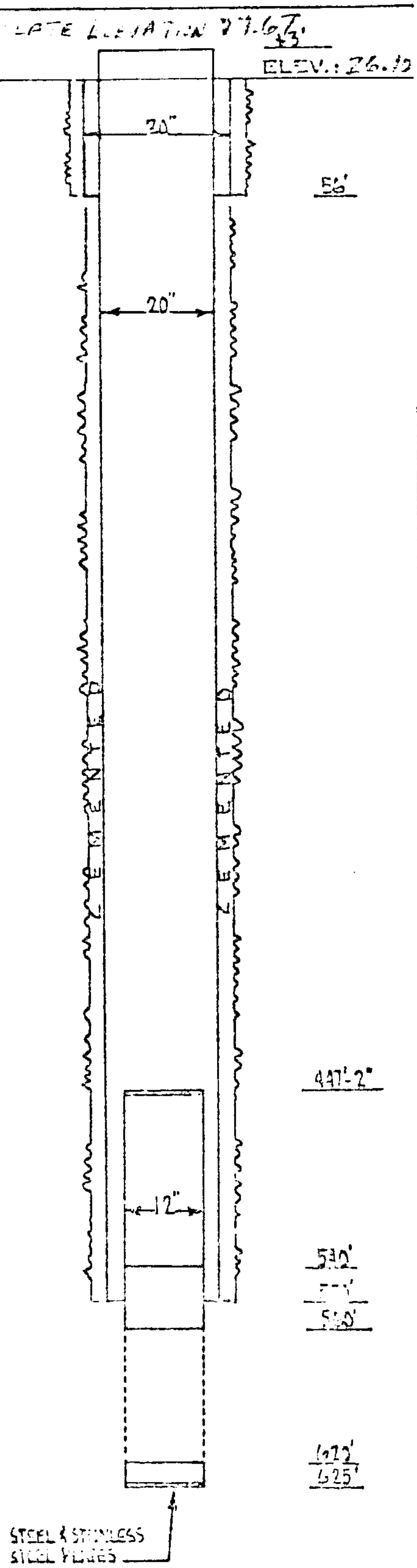
Thomas V. Whiteside, Jr.

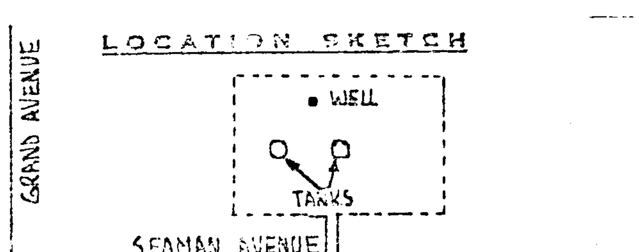
Thomas V. Whiteside, Jr., P.E.
Vice President and
Manager - Production

TVW:mjs
enclosures

2

ORIGINAL GROUND LEVEL	0'
BROWN SAND & GRAVEL	35'
[illegible]	39'
[illegible]	49'
CLAY-[illegible]	64'
GR. SAND & GRAV-CLAY [illegible]	76'
CLAY	84'
GRAY SAND LIGNITE-PYRITES CLAY	137'
CLAY-LIGN-PYRI-[illegible]	139'
SAND STKS-CLAY-PYRI.	142'
CLAY	145'
[illegible]	159'
CLAY, [illegible] SAND ST[illegible]	192'
SAND LIGNITE & CLAY	251'
CLAY-LIGNITE-PYRITE	255'
GREY SAND	232'
CLAY SILTY SAND	284'
HARD PACKED FINE SAND	319'
GREY CLAY-[illegible] PYRI.	326'
[illegible]	333'
[illegible]	343'
[illegible]	357'
[illegible]	365'
[illegible] STKS CLAY	383'
CLAY	387'
SAND-CLAY STKS-LIGN.	410'
CLAY-[illegible]	415'
[illegible]	419'
GREY CLAY-[illegible] SAND	424'
GREY SAND CLAY & LIGNITE	501'
CLAY-LIGNITE & PYRITES-SAND STKS	519'
COARSE SAND & GRAVEL PYRITES & CLAY	551'
HARD PACKED FINE SAND PYRITE-LIGNITE-CLAY ST[illegible]	594'
[illegible] SAND & [illegible] CLAY	616'
SAND-GRAV, CLAY STKS	625'



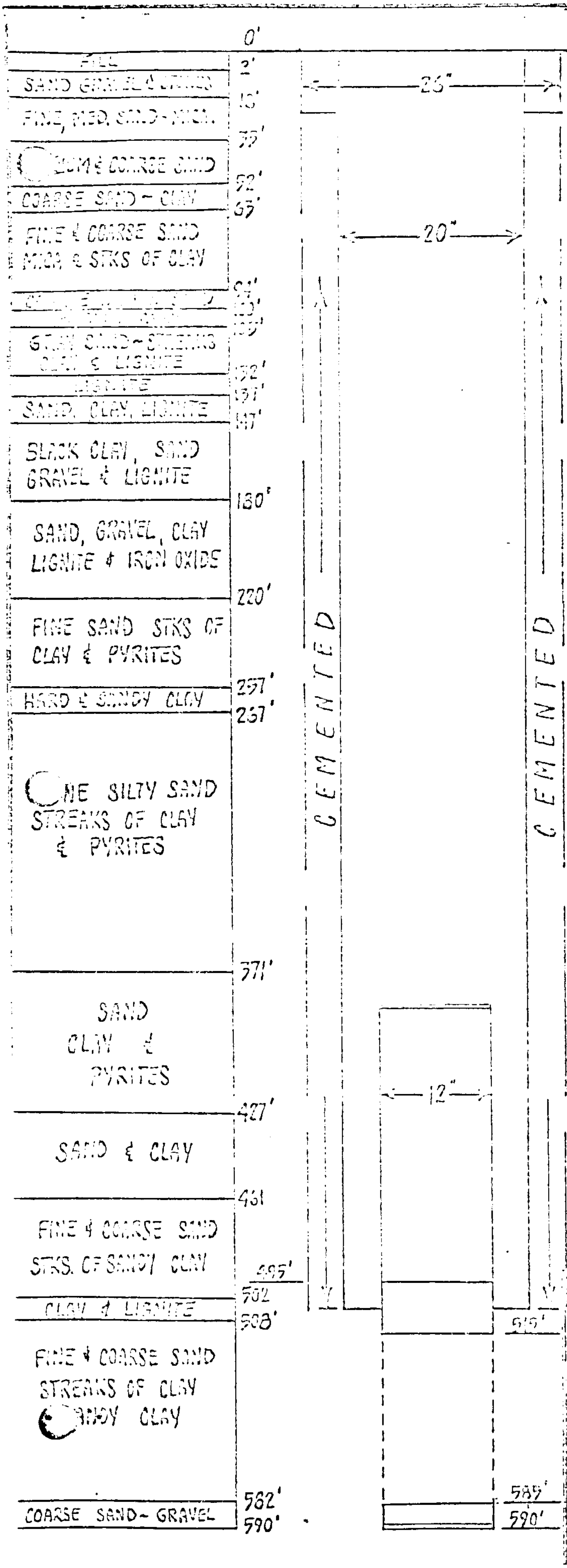


LAYNE-NEW YORK CO., INC. - LINDEN, N. J.
WATER SUPPLY CONTRACTORS
LONG ISLAND WATER CORP._N SIDE SEAMAN AVENUE- BALDWIN, LONG ISLAND

DRAWN BY BH.
LAYNE WELL # 19

STATE # N-8196 E
CUSTOMER WELL # 4-17

3



505' LAYNE-NEW YORK CO., INC. LINDEN, N. J.

WATER SUPPLY CONTRACTORS N- 7831

LONG ISLAND WATER CORPORATION

DARTMOUTH & DE-MOTT ST., BALDWIN, L. I.

DRAWN BY N.M. APPROVED BY

LAYNE WELL NO. 17 THEIR Nº 22-1 DRAWING NO. 4

ARCS II CONTRACT 68-W9-0051
MALCOLM PIRNIE, INC.
RECORD OF TELEPHONE CONVERSATION/AGREEMENT

File No. 8002-09-1

Date: 1/22/93 Time: 9:00 AM ☒ PM ☐

Outgoing Call

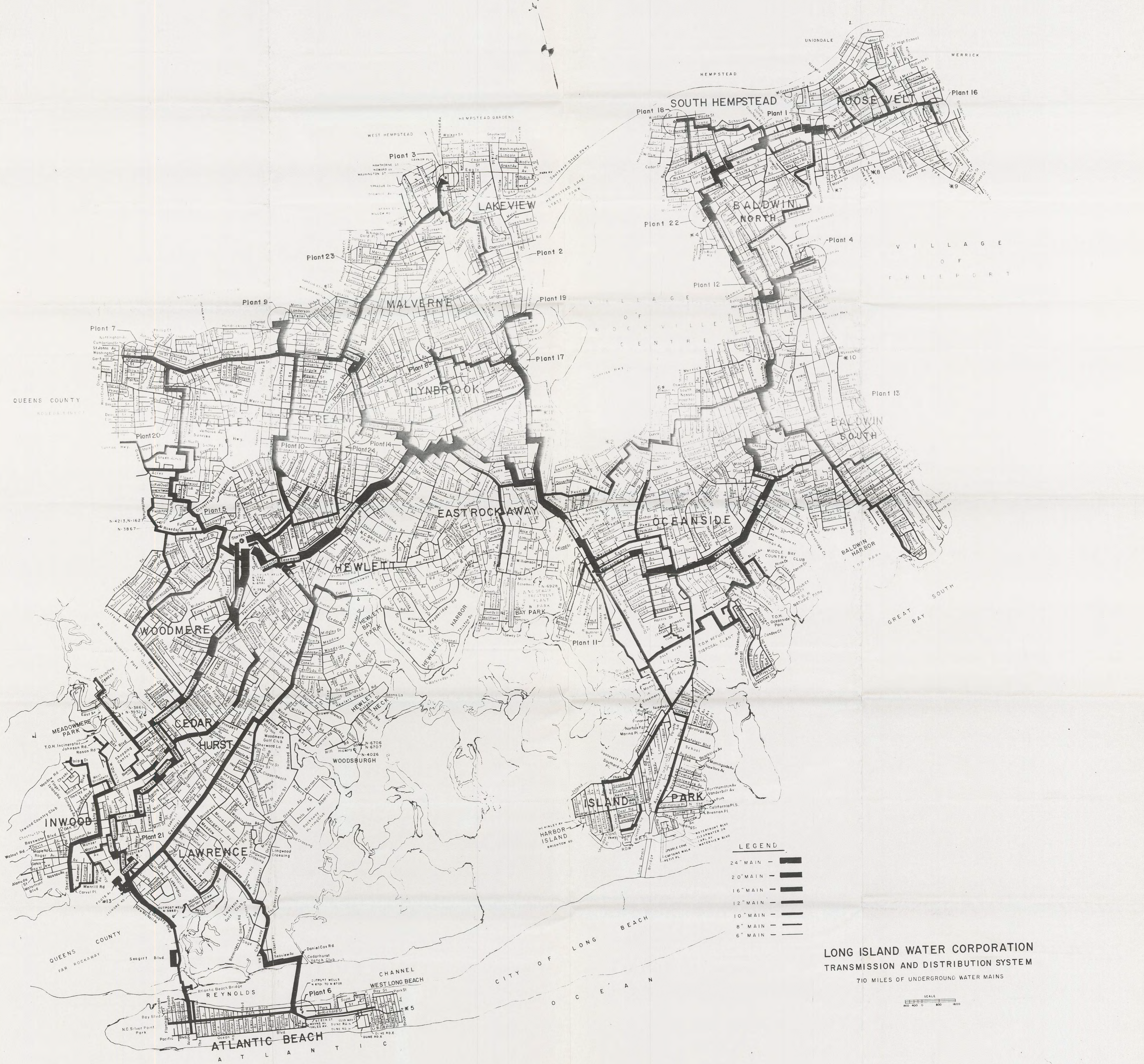
To: Thomas V. Whiteside, Jr., P.E. 1-516-593-1000
Telephone No.

Affiliation: Vice President, Long Island Water Corporation

Malcolm Pirnie Staff: Steven T. McNulty (609) 860-0100
Telephone No.

Summary of Conversation:

Mr. Whiteside informed me the standby (Upper Glacial aquifer) wellfield has not been operated within the past five years, but only requires basic maintenance and cleaning of well screens to be put into use. Mr. Whiteside also stated that approximately 135 wells are currently pumping to the Long Island Water Corporation system and that no one well supplies more than 40% of the total water supply.


LONG ISLAND WATER CORPORATION
TRANSMISSION AND DISTRIBUTION SYSTEM
710 MILES OF UNDERGROUND WATER MAINS
LEGEND
24" MAIN
20" MAIN
16" MAIN
12" MAIN
10" MAIN
8" MAIN
6" MAIN
SCALE
SOUTH HEMPSTEAD
ROOSEVELT
BALDWIN NORTH
BALDWIN SOUTH
BALDWIN HARBOR
VILLAGE OF FREEPORT
VILLAGE OF ROCKVILLE CENTRE
LAKEVIEW
MALVERNE
LYNBROOK
VALLEY STREAM
EAST ROCKAWAY
OCEANSIDE
HEWLETT
HEWLETT BAY PARK
HEWLETT HARBOR
HEWLETT NECK
WOODMERE
WOODSBURGH
CEDARHURST
MEADOWMERE PARK
INWOOD
LAWRENCE
ISLAND PARK
HARBOR ISLAND
BAY PARK
ATLANTIC BEACH
WEST LONG BEACH
REYNOLDS CHANNEL
CITY OF LONG BEACH
ATLANTIC OCEAN
GREAT SOUTH BAY
QUEENS COUNTY
FAR ROCKAWAY
UNIONDALE
HEMPSTEAD
MERRICK
WEST HEMPSTEAD
HEMPSTEAD GARDENS
Plant 1
Plant 2
Plant 3
Plant 4
Plant 5
Plant 6
Plant 7
Plant 8
Plant 9
Plant 10
Plant 11
Plant 12
Plant 13
Plant 14
Plant 15
Plant 16
Plant 17
Plant 18
Plant 19
Plant 20
Plant 21
Plant 22
Plant 23
Plant 24

REFERENCE NO. 21

MALCOLM PIRNIE, INC. PROJECT NOTES

To: File | Date: 12/20/91
From: Steven T. McNulty | Project Number: 8002-09-1
Subject: Fisheries | Site Name: Merrick Landfill

The table "New York - Shellfish Production" was obtained thru the National Marine Fisheries Service. The table outlines the amounts of shellfish caught for human consumption along the southern coast of Long Island, New York. The area of interest in reference to the Merrick SI, is the Hard Clam catch for the Township of Hempstead

FOR PUBLICATION

ANNUAL 1990
(Date)

NEW YORK--SHELLFISH PRODUCTION

Township	Hard Clams (bushels)		Soft Clams (bushels)		Oysters (bushels)		Bay Scallops (pounds)		Mussels (bushels)		Razor Clams (bushels)		Conchs (bushels)	
	Total	Value	Rakes	Value	Var.G	Value	Dr.	Value	Var.G	Value	Rakes	Value	Var.G	Value
Hempstead SS4A	1848	134412												
Oyster Bay SS4A	1255	94353	72	3503										
Babylon SS4A	4749	363736							12	114			3	58
Islip SS4A	38524	2940531												
Brookhaven SS4A	37324	2819044	88	4100										
Brookhaven SS6	750	57452	4	180					4104	42103				
Southampton SS6	4290	327188	263	12839	71	3116			2659	26572			18	378
Southampton 8	30116	2241605	196	9357	22	512	803	9490						
East Hampton 8	995	79265	315	15283	181	9021	996	13330	39	351			30	600
Shelter Island 8	144	10466	15	742			66	528						
Southold 8	17725	1336474	73	3486	50	2265	8803	108647	308	2985			5165	99859
Riverhead 8														
Brookhaven NS9	2765	209155	4862	234617	1710	48825			2	18				
Smithtown NS9	600	46460	4738	227841	651	31477								
Huntington NS9	43333	3272220	245	11939	5418	139780			35	361			60	1260
Oyster Bay NS9	20739	1574951	662	31921	98570	3819358			70	770				
SOUTHOLD NS9	73	5777	40	2196	15	702							411	7398
At. Ocean (612-1) Nassau Cnty. (15)														
At. Ocean (612-1) Richmond Cnty. (27)														
TOTALS	205230	15513089	11573	558004	106688	4055056	10668	131995	7229	73274			5687	109553

Unclassified	
Pounds	Value

Sea Scallops	
Pounds	Value
44425	178250

Lobsters	
Pounds	Value
2616476	8361626

Snapping (TURTLES)	
Pounds	Value

Terrapin (TURTLES)	
Pounds	Value

Jonah Crabs Inshore-Offshore Lobster Pot Bts.	
Pounds	Value
480	361

Hard Blue Crabs	
Bushel	Value
8973	196117

Slipper Snails (Crapidula) (Quarter Decks)	
Bushel	Value

Moon Snails	
Bushel	Value

Horse Shoe Crabs	
Pounds	Value

Mantis Shrimp	
Pounds	Value

Sea Clams	
Bushel	Value
* 720473	4285016

Ocean Quahogs	
Bushel	Value
211	3587

*1990 NMFS TOTALS 739241 BUSHELS $4398484

THESE NMFS FIGURES INCLUDE SOME 1989 DATA
THAT WAS NOT AVAILABLE WHEN THE DEC 1989 ANNUAL WAS PUBLISHED

REFERENCE NO. 22

STATE OF NEW YORK
DEPARTMENT OF STATE
ALBANY, N.Y. 12231-0001

GAIL S. SHAFFER
SECRETARY OF STATE

November 18, 1991

Steven McNulty
Malcolm-Pirnie, Inc.
197 Route 18
Turnpike Plaza - Suite 3000
East Brunswick, NJ 08816

Dear Mr. McNulty:

I've enclosed copies of narratives for the significant habitat areas in the vicinity of the Merrick Landfill in Hempstead as you requested the other day over the phone. The draft habitat narratives for Arthur Kill/Mill Creek area on Staten Island are not available at this point, but will be available in the near future.

I hope this information comes in handy for you. Please call me at (518) 474-3642 if you have any questions about the materials.

Sincerely,

Michael Corey

Michael Corey
Senior Environmental Analyst

Enclosures
MC/jtb

COASTAL FISH AND WILDLIFE HABITAT RATING FORM

Name of Area: East Hempstead Bay

County(ies): Nassau

Town(s): Hempstead

FEB. 1 6 1987

7.5' Quadrangle(s): Freeport, NY; Jones Inlet, NY

	(IS) Individual Score		(R) Replace-ability		(ISxR) Final Score
ECOSYSTEM RARITY (ER): One of the largest, undeveloped, coastal wetland ecosystems in New York State.	64	x	1.2	=	76.8
SPECIES VULNERABILITY (SV): Common tern (T), northern harrier (T), short-eared owl (SC), and diamondback terrapin (SC); additive division: 25 + 25/2 + 16/4 + 16/8 = 43.5.	43.5	x	1.2	=	52.2
HUMAN USE (HU): One of the most important waterfowl hunting areas on Long Island.	9	x	1.2	=	10.8
POPULATION LEVEL (PL): Wintering waterfowl concentrations (brant, especially) of regional significance.	9	x	1.2	=	10.8

REPLACEABILITY (R): 1.2
Irreplaceable

SIGNIFICANCE = [(ERxR)+(SVxR)+(HUxR)+(PLxR)] = 150.6

SIGNIFICANT COASTAL FISH AND WILDLIFE HABITAT

PROJECT DESCRIPTION

EAST HEMPSTEAD BAY

LOCATION AND DESCRIPTION OF HABITAT:

East Hempstead Bay ("East Bay") is located along the south shore of Long Island, between the Meadowbrook State Parkway and Wantagh State Parkway, in the Town of Hempstead, Nassau County (7.5' Quadrangles: Freeport, N.Y.; and Jones Inlet, N.Y.). This approximate 5000 acre area is generally defined by the mean high water elevation on the north and south sides, by the shoulder of the Meadowbrook Parkway on the west, and by the edge of the Wantagh Parkway right-of-way on the east. The fish and wildlife habitat is the entire bay, which includes extensive areas of undeveloped salt marsh, tidal flats, dredge spoil islands, and open water. Water depths in the bay vary from less than 6 feet (below mean low water) in the natural creeks and small bays, to over 20 feet in portions of some dredged navigation channels and in the large open water area of the bay. Tidal fluctuations in the bay average approximately 3.6 - 4.2 feet. Most of East Hempstead Bay is owned by the Town of Hempstead and is managed as a wetland conservation area, with allowance for mosquito control activities (ditching). The bay is bordered by high density residential development and small craft harbor facilities to the north. All other sides of the bay are bordered by undeveloped highway corridors, including the Bay State Parkway in Jones Beach State Park, south of the Sloop Channel.

FISH AND WILDLIFE VALUES:

East Hempstead Bay comprises approximately one-third of the vast Hempstead Bays wetland complex. The bay represents one of the largest undeveloped coastal wetland ecosystems in New York State. This highly diverse area is important to fish and wildlife throughout the year. Common terns (T) nest in several locations in the bay, including Olivers Island and Cuba Island. An estimated 130 pairs and 190 pairs, respectively, of common terns were observed nesting in the area during 1984 and 1985. East Hempstead Bay is also inhabited by a variety of nesting heron species, including snowy egret, great egret, and black-crowned night heron. This area is also one of the few locations on Long Island where yellow-crowned night heron, tri-colored heron, and little blue heron have been found nesting. Heronries have been established in several locations along the Meadowbrook State Parkway, on Jones Island. Nests are usually placed in woody vegetation which has become established on abandoned highway right-of-ways and dredge spoil deposits. As of 1977, Jones Island contained regionally significant nesting concentrations of snowy egret, black-crowned night heron, and glossy ibis, with estimates of 183, 30, and 260 pairs respectively. The 13 pairs of yellow-crowned night herons nesting here in 1977 comprised over half of the known Long Island population that year. However, by 1983, the heronry contained fewer numbers overall, with an estimated 8 pairs of green-backed heron, 1 pair of snowy egret, 63 pairs of black-crowned night-heron, 21 pairs of yellow-crowned night-heron, and 2 pairs of glossy ibis. All of these nesting birds were absent from Jones Island in 1984 and 1985. Northern harrier (T) and short-eared owl (SC) also nested in East Bay (along the Meadowbrook State Parkway right-of-way) in 1983 and 1984. Other species nesting in the area include Canada goose, herring gull, black duck, mallard, American oystercatcher, clapper rail, willet, fish crow, marsh wren, sharp-tailed sparrow, and seaside sparrow. The salt marshes, intertidal flats, and shallows in East Hempstead Bay are used extensively as feeding areas for birds nesting here and for many other species during migration (shorebirds in particular).

East Hempstead Bay is one of the most important waterfowl wintering areas (November - March) on Long Island. Mid-winter aerial surveys of waterfowl abundance for the ten year period 1975-1984 indicate average concentrations of over 1,400 birds in the bay each year (2,930 in peak year), including approximately 930 brant (2,520 in peak year), 360 black ducks (1,150 in peak year), and 90 scaup (500 in peak year), along with lesser numbers of mallard, Canada goose, oldsquaw, common goldeneye, bufflehead, and red-breasted merganser. East Hempstead Bay supports regionally significant concentrations of brant. Waterfowl use of the bay during winter is influenced in part by the extent of ice cover each year. Generally, brant and geese feed in open water areas through midwinter, while later in spring (prior to migration), the birds feed extensively in the salt marshes. Concentrations of waterfowl also occur in the area during spring and fall migrations (March - April and October - November, respectively). All of East Hempstead Bay is open to the public for waterfowl hunting, and the area supports regionally significant hunting pressure.

In addition to having significant bird concentrations, East Hempstead Bay is a productive area for marine finfish, shellfish, and other wildlife. The bay serves as a nursery and feeding area (April - November, generally) for bluefish, winter flounder, summer flounder, kingfish, weakfish, blackfish, snapper, scup, blue claw crab, and forage species, such as Atlantic silverside, menhaden, pipefish, and sticklebacks. As a result of the abundant fisheries resources in the bay, and its proximity to the New York metropolitan area, East Hempstead Bay receives heavy recreational fishing pressure, of regional significance. The bay is inhabited by hard clams, soft clams, ribbed mussels and blue mussels but most of the bay waters are not certified for commercial shellfishing. There is considerable potential for harvesting young clams from the area for transplanting into commercial aquaculture areas. Diamondback terrapin (SC) nest among the salt marsh islands in the bay. Muskrat populations in the area support a significant amount of trapping by local residents.

IMPACT ASSESSMENT:

Any activity that would substantially degrade the water quality in East Hempstead Bay would adversely affect the biological productivity of this area. Most species of fish and wildlife are affected by water pollution, such as chemical contamination (including food chain effects), oil spills, excessive turbidity, and waste disposal. Efforts should be made to improve water quality in the bay, including control of sewage discharges from recreational boats and upland sources. Alteration of tidal patterns in East Hempstead Bay would have major impacts on the fish and wildlife communities present. No new navigation channels should be excavated within the area. Dredging to maintain existing boat channels in the bay should be scheduled in late summer and fall to minimize impacts on fish and shellfish, and to allow for spoil disposal when wildlife populations are least sensitive to disturbance. Elimination of salt marsh and shallow areas, through excavation or filling, would result in a direct loss of valuable habitat area. Unregulated dredge spoil disposal in this area could be detrimental, but such activities may be designed to maintain or improve the habitat for certain species of wildlife. Nesting birds inhabiting the East Hempstead Bay area are highly vulnerable to disturbance by humans from mid-April through July. Recreational use (e.g., boat landing, picnicking) and highway maintenance activities in or adjacent to significant bird nesting areas should be minimized during this period, through the use of annual posting or fencing. Construction of shoreline structures, such as docks, piers, bulkheads, or revetments, in areas not previously disturbed by development (i.e., natural salt marsh, tidal flats, and shallows), may result in the loss of productive areas which support the fish and wildlife resources of East Hempstead Bay.

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Quad: Freeport, NY
Area Name: East Hempstead Bay
Habitat Boundary: ————
Page 1 of 4

FREEPORT

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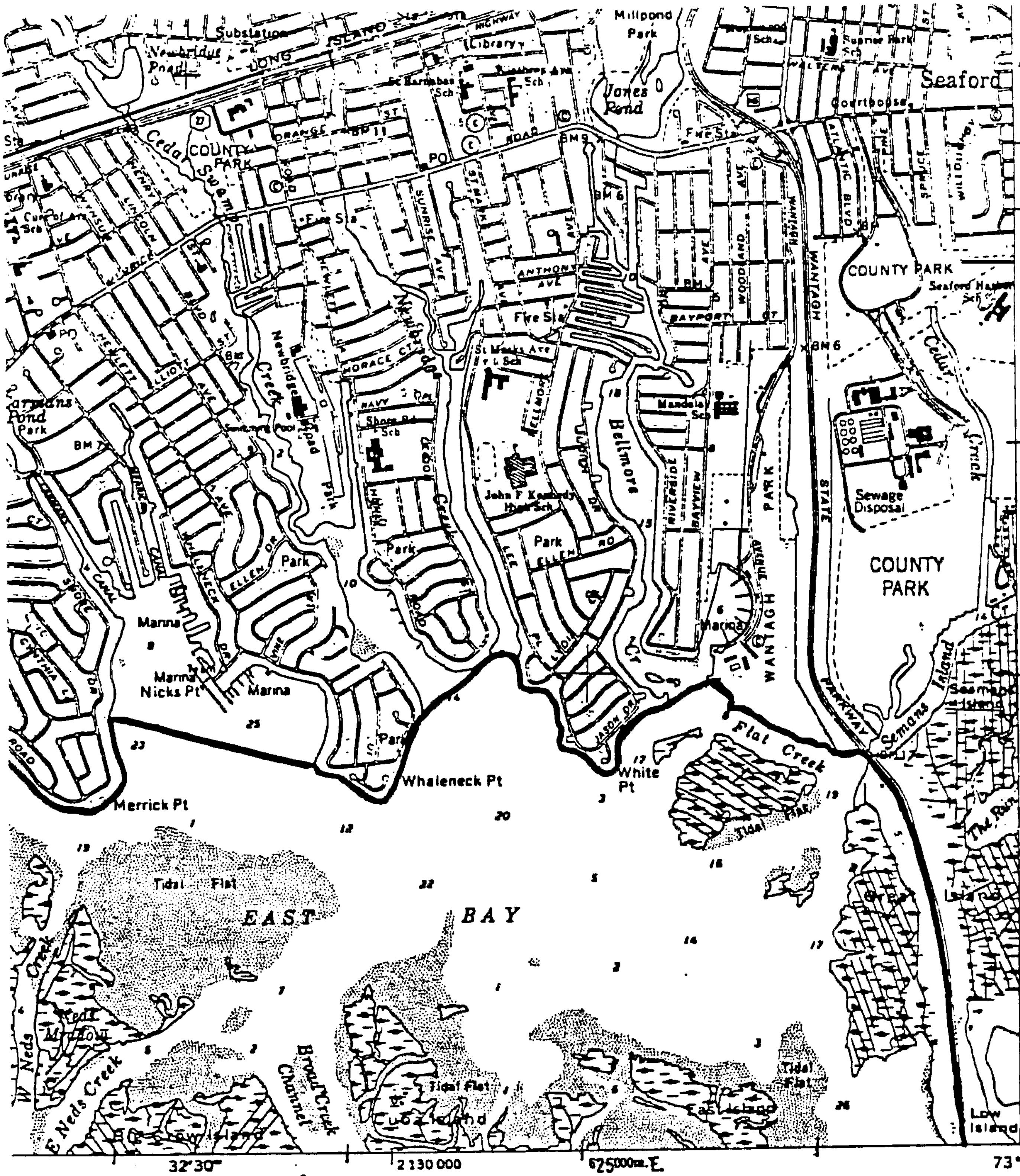

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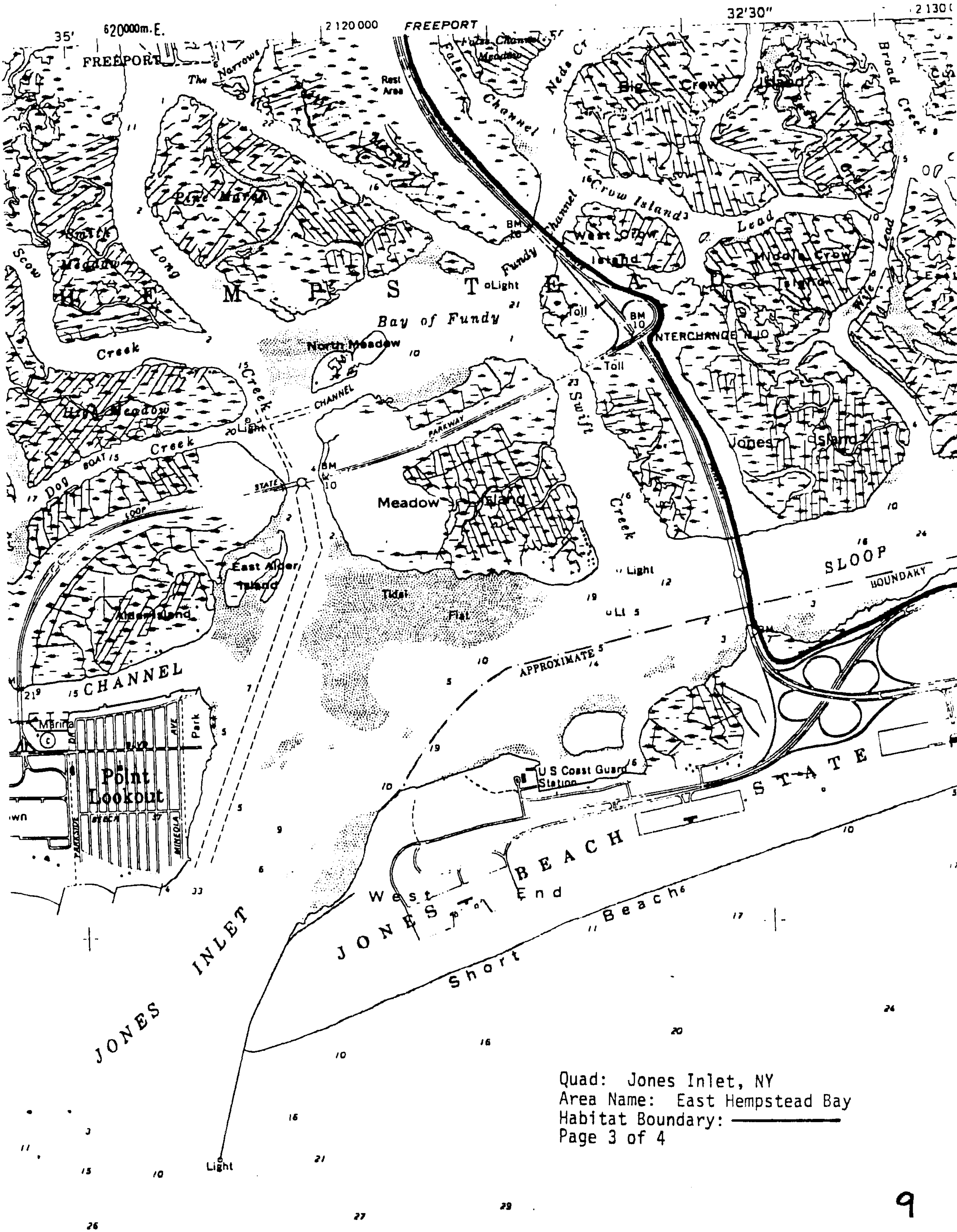
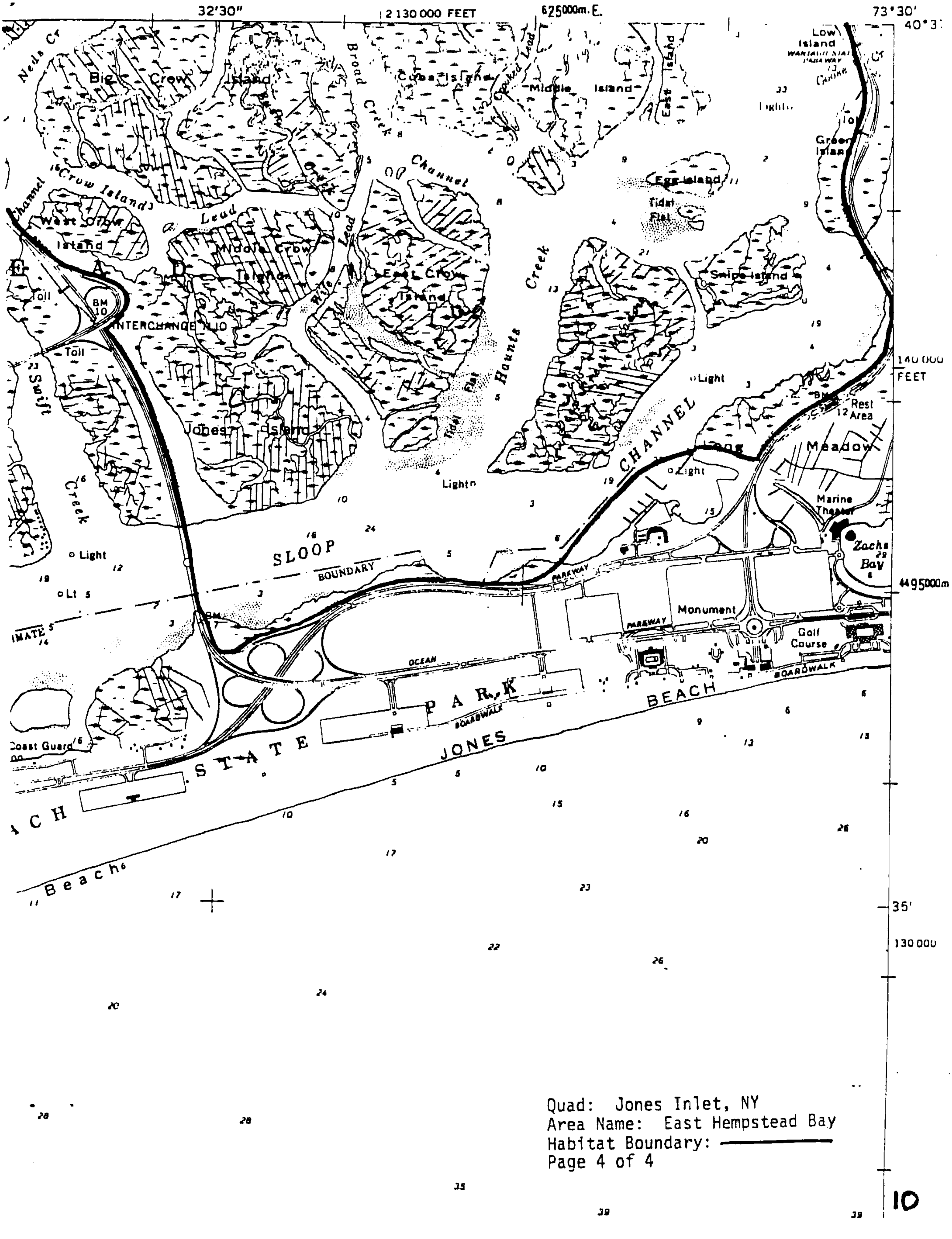
Quad: Freeport, NY
Area Name: East Hempstead Bay
Habitat Boundary:
Page 2 of 4



Quad: Jones Inlet, NY
Area Name: East Hempstead Bay
Habitat Boundary: ———
Page 3 of 4



Quad: Jones Inlet, NY
Area Name: East Hempstead Bay
Habitat Boundary:
Page 4 of 4

COASTAL FISH & WILDLIFE HABITAT RATING FORM

Name of Area: Short Beach, Jones Beach State Park

County(ies): Nassau

Town(s): Hempstead

FEB. 16 1987

7.5' Quadrangle(s): Jones Inlet, NY

	(IS) Individual Score		(R) Replace-ability		(ISxR) Final Score
ECOSYSTEM RARITY (ER):	0	x	1.0	=	0.0

Undeveloped barrier beach habitat is rare in Nassau County, but ecosystem rarity is diminished by recreation disturbance. Geometric mean: 0 x 9 = 0

SPECIES VULNERABILITY (SV):	48.5	x	1.0	=	48.5

Least tern (E) and piping plover (T) nesting. Additive division: 36 + 25/2 = 48.5

HUMAN USE (HU):	0	x	1.0	=	0.0

No significant wildlife related human uses of the area.

POPULATION LEVEL (PL):	4	x	1.0	=	4.0

The concentration of piping plovers in 1984 unusual in Nassau County.

REPLACEABILITY (R): 1.0

Uncertain of ability to replace the habitat or the population level.

SIGNIFICANCE = [(ERxR) + (SVxR) + (HUxR) + (PLxR)] = 52.5

SIGNIFICANT COASTAL FISH AND WILDLIFE HABITAT

PROJECT DESCRIPTION

SHORT BEACH

LOCATION AND DESCRIPTION OF HABITAT:

Short Beach is located in Jones Beach State Park, just east of West End, and south of Parking Lot 1. This area is owned by the Long Island State Park Commission, and is within the Town of Hempstead, Nassau County (7.5' Quadrangle: Jones Inlet, N.Y.). The fish and wildlife habitat consists of approximately 45 acres of sparsely vegetated sand dunes, and a wet swale area situated between the open beach and the parking lot. During 1984, the recreation facilities at this location were open on weekends only.

FISH AND WILDLIFE VALUES:

The Short Beach fish and wildlife habitat consists of a small segment of undeveloped barrier beach dunelands. This ecosystem type is generally rare in Nassau County, being found primarily within Jones Beach State Park. However, development and use of the adjacent recreation facilities has resulted in some degradation of the habitat. Short Beach serves as an important nesting site for piping plovers (T), with approximately 5 pairs nesting in the area in 1984 and at least one pair in 1985. The area also serves as a nesting site for least terns (E); as recently as 1976, approximately 55 pairs nested in the area. In 1984, several hundred least terns were observed in the area, although no evidence of nesting was found. In 1985, 102 breeding pairs were observed nesting here. Other bird species regularly observed in the area include horned lark, marsh wren, common tern (T), killdeer, willet, and mallard. Although over 250,000 people visit Jones Beach State Park during the summer months; there are no significant human use activities specifically associated with the wildlife resources at Short Beach. Jones Beach State Park also provides important access for mobile sportsfishermen who use off-road vehicles to reach the valuable surf fishery at this site.

IMPACT ASSESSMENT:

Nesting shorebird species inhabiting the barrier beaches of Long Island are highly vulnerable to disturbance by humans from mid-April through July. The 5 pairs of piping plover nesting at Jones Beach (in 1984) are a valuable part of the Atlantic Coast population (476 pairs total in 1985) and must not be disturbed. Significant pedestrian traffic or recreational vehicle use of the upper beach, dunes, or wetland area could easily destroy the Short Beach nesting habitat, and should be minimized during this period. Traditional uses on the lower beach such as pedestrian traffic or mobile sportsfishing are generally compatible with the use of the upper beach and primary dune area by nesting shorebirds. Specific bird nesting areas should be fenced and posted annually at these sites to restrict human disturbance. Although nesting sites may change from year to year, human disturbance of the upper beach and dunes (above the spring high tide line) must be avoided in order to preserve these sites' value as a nesting habitat. Unregulated dredge spoil disposal in this area could be detrimental, but such activities may be designed to maintain or improve the habitat, by setting back vegetative succession. The wet swale area west of the parking lot should remain undisturbed as an area for various bird species to use for feeding, resting, and bathing. Introduction or attraction of mammalian predators to the area would be detrimental to reproduction and nesting of piping plover populations and to the possible return of least tern nesting and should be avoided.

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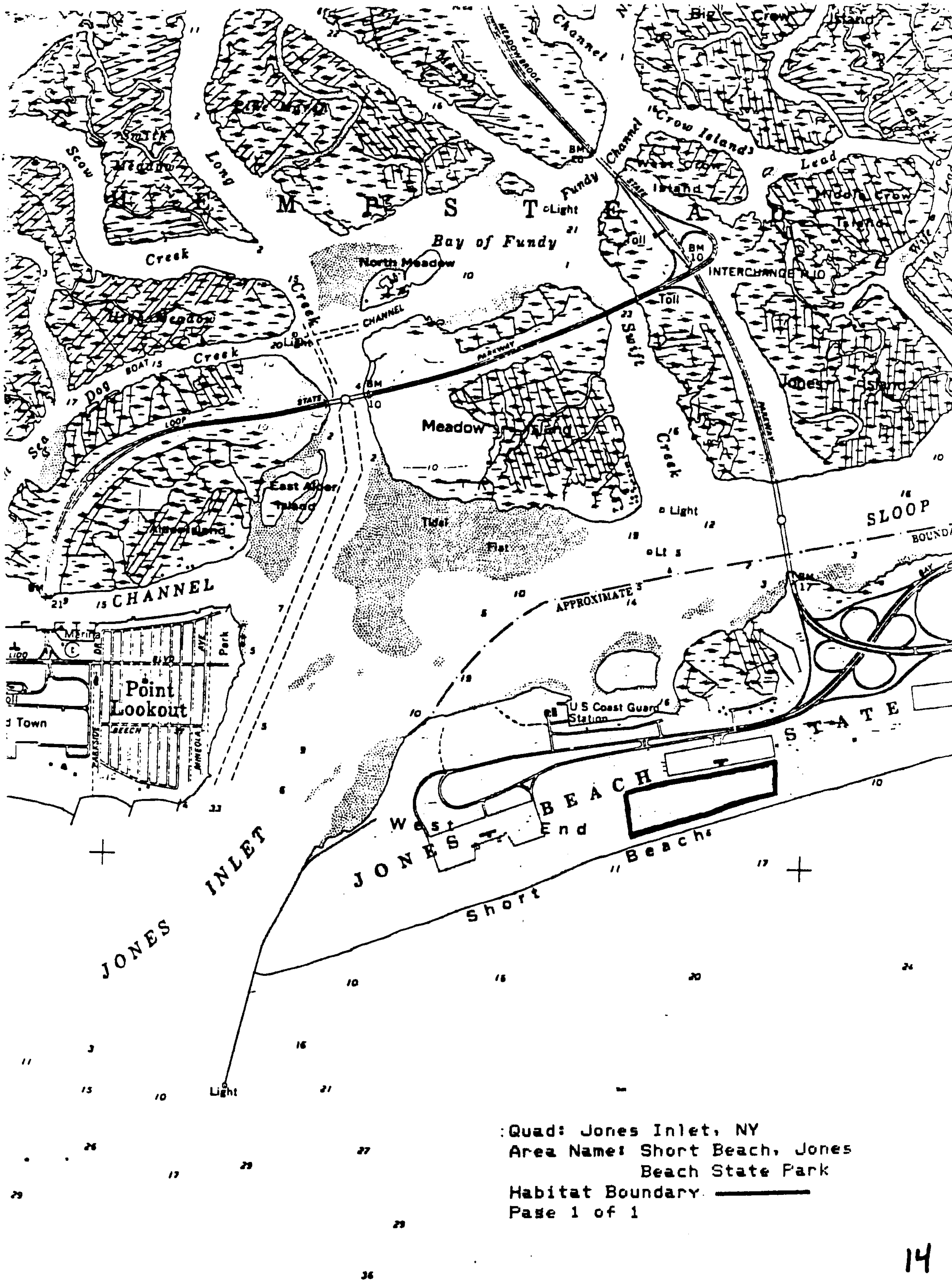

:Quad: Jones Inlet, NY
Area Name: Short Beach, Jones Beach State Park
Habitat Boundary ———
Page 1 of 1

COASTAL FISH AND WILDLIFE HABITAT RATING FORM

Name of Area: Nassau Beach

County(ies): Nassau

Town(s): Hempstead

FEB. 1 6 1987

7.5' Quadrangle(s): Jones Inlet, NY

	(IS) Individual Score		(R) Replace-ability		(ISxR) Final Score
ECOSYSTEM RARITY (ER): Relatively undisturbed barrier beach habitat is rare in Nassau County.	9	x	1.0	=	9.0
SPECIES VULNERABILITY (SV): Least tern (E) and piping plover (T) nesting. Additive division: 36 + 25/2 = 48.5.	48.5	x	1.0	=	48.5
HUMAN USE (HU): No significant fish or wildlife related human uses of the area.	0	x	1.0	=	0.0
POPULATION LEVEL (PL): Population of nesting least terns was among the 10 largest on Long Island in 1982, 1983, and 1984.	9	x	1.0	=	9.0

REPLACEABILITY (R): Uncertain of ability to replace the habitat or the population level. 1.0

SIGNIFICANCE = [(ERxR)+(SVxR)+(HUxR)+(PLxR)] = 15 66.5

SIGNIFICANT COASTAL FISH AND WILDLIFE HABITAT

PROJECT DESCRIPTION

NASSAU BEACH

LOCATION AND DESCRIPTION OF HABITAT:

Nassau Beach is located approximately one mile west of Point Lookout, on the westernmost barrier island on Long Island's south shore. The beach is located within Nassau Beach County Park, in the Town of Hempstead, Nassau County (7.5' Quadrangle: Jones Inlet, N.Y.). The fish and wildlife habitat consists of approximately 15 acres of sparsely vegetated dunes and the adjoining shell and pebble area inland and north of the dunes. Although the beach receives heavy recreational use during the summer, the habitat area is generally located behind the open beach, and receives relatively little human disturbance. The Town of Hempstead and Nassau County posted and fenced the area in 1984 and 1985.

FISH AND WILDLIFE VALUES:

The Nassau Beach fish and wildlife habitat consists of a small segment of undeveloped barrier beach ecosystem. Development and use of the adjacent recreation facilities has resulted in relatively little degradation of the habitat. Areas such as this are rare in Nassau County. Nassau Beach serves as an important nesting site for least terns (E) and piping plovers (T). During 1982, 1983, and 1984 there were 114, 163, and 107 least terns recorded respectively as nesting on the site. In 1983 and 1984 there were 2 and 4, respectively, adult piping plovers recorded nesting at the site. The colony was inactive in 1985. The least tern populations at this site in 1983 and 1984 were the largest in Nassau County, and were among the ten largest on Long Island in those years. There are no significant human use activities specifically associated with the wildlife resources at Nassau Beach.

IMPACT ASSESSMENT:

Nesting shorebird species inhabiting the barrier beaches of Long Island are highly vulnerable to disturbance by humans from mid-April through July. Significant pedestrian traffic or recreational use of the dunes and adjacent inland area could easily destroy the Nassau Beach tern and plover nesting habitat, and should be minimized during this period. Construction of adjacent recreational facilities should be designed to minimize impacts to the nesting areas. Fencing and/or annual posting of the bird nesting area should be provided to help protect the nesting bird species. Unregulated dredge spoil disposal in this area would be detrimental, but such activities may be designed to maintain or improve the habitat, by setting back vegetative succession. Introduction or attraction of mammalian predators to the Nassau Beach area would also be detrimental to the populations of nesting birds.

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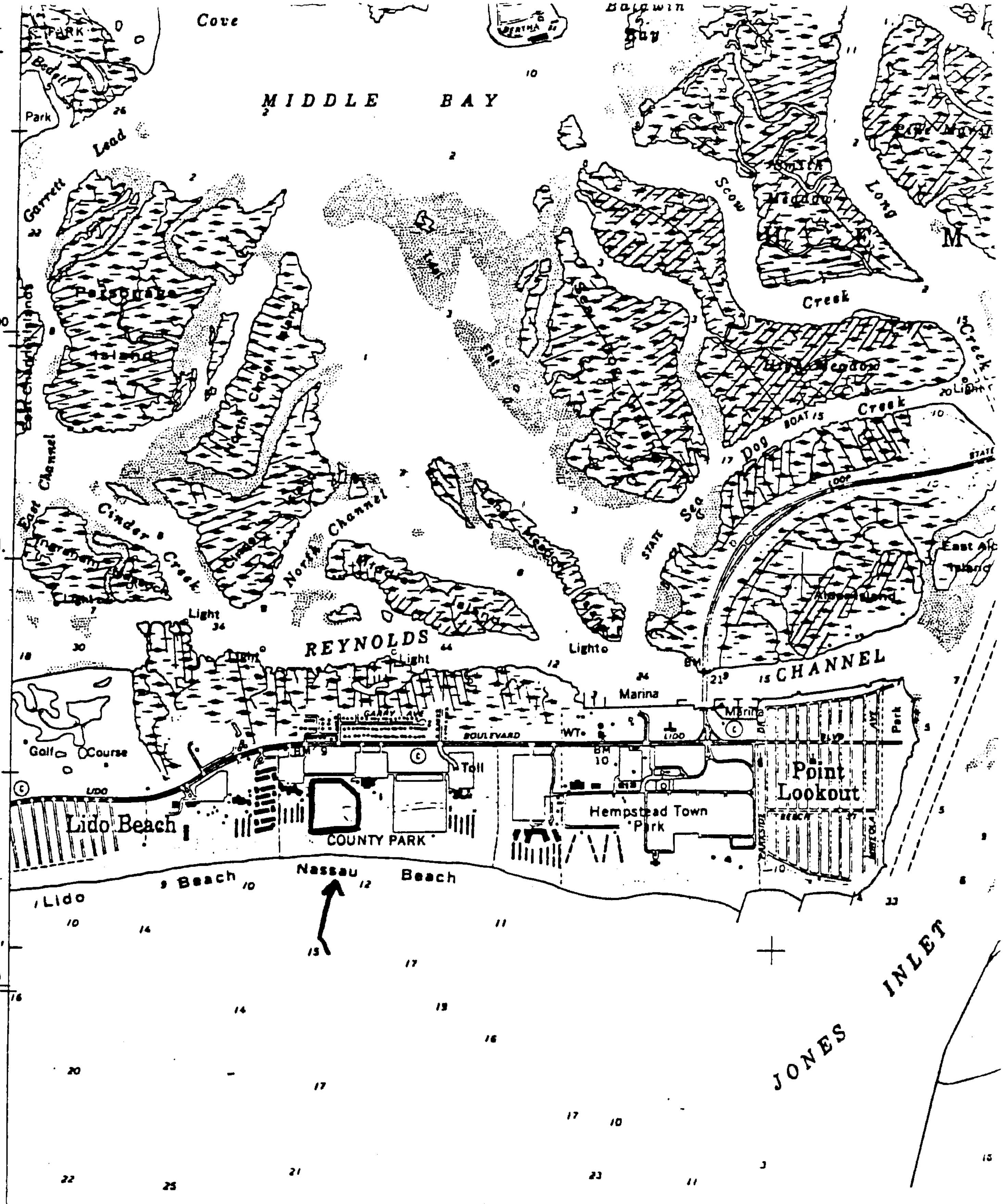

Quad: Jones Inlet, NY
Area Name: Nassau Beach
Habitat Boundary
Page 1 of 1

COASTAL FISH AND WILDLIFE HABITAT RATING FORM

Name of Area: Storehouse, Jones Beach State Park

County(ies): Nassau

Town(s): Hempstead

FEB. 1 6 1987

7.5' Quadrangle(s): Jones Inlet, NY

	(IS) Individual Score		(R) Replaceability		(ISxR) Final Score
ECOSYSTEM RARITY (ER): Mid-succession shrubland and pine stands, not rare in Nassau County.	0	x	1.0	=	0.0
SPECIES VULNERABILITY (SV): No endangered, threatened, or special concern species reside in the area.	0	x	1.0	=	0.0
HUMAN USE (HU): County-level significance for birdwatching and nature study opportunities.	4	x	1.0	=	4.0
POPULATION LEVEL (PL): The concentrations of nesting egrets and herring gulls in the area have been among the largest and most consistent in New York State.	16.0	x	1.0	=	16.0

REPLACEABILITY (R): Uncertain of ability to replace the habitat or the population level.		1.0

SIGNIFICANCE = [(ERxR)+(SVxR)+(HUxR)+(PLxR)] = 20.0

SIGNIFICANT COASTAL FISH AND WILDLIFE HABITAT

PROJECT DESCRIPTION

STOREHOUSE, JONES BEACH STATE PARK

LOCATION AND DESCRIPTION OF HABITAT:

The "Storehouse" area in Jones Beach State Park is located between Bay State Parkway and Ocean Parkway, east of the interchange with Meadowbrook State Parkway. This approximate 75 acre area is owned by the Long Island State Park Commission, and is within the Town of Hempstead, Nassau County (7.5' Quadrangle: Jones Inlet, N.Y.). The habitat includes the entire median area, which consists largely of dense shrub cover, with several small stands of pitch pine (40-60' tall) and sandy areas with sparse herbaceous vegetation.

FISH AND WILDLIFE VALUES:

Despite its location on a major barrier island, the Storehouse area itself does not represent a rare ecosystem type. The significance of this habitat is its use for nesting by relatively large numbers of several species of herons and gulls. In 1977, Storehouse was the site of the largest nesting concentration of great egrets in New York State, with an estimated 140 pairs of birds observed. Also nesting in the area were an estimated 30 pairs of black-crowned night herons, and 2 pairs of glossy ibis. In recent years, these species have continued to nest here, along with snowy egrets, but population levels have declined. During 1982-1985, there were an estimated 30-50 pairs of great egrets, up to 48 pairs of snowy egrets, up to 120 pairs of black-crowned night herons, and up to 110 pairs of glossy ibis. This is the last remaining heron rookery on the Jones Beach to Captree barrier beach. In general, the heronries have moved from near highways and other human use areas to a number of islands in the adjacent bays. It remains to be seen whether the heron and ibis populations at Storehouse will continue to decline. Approximately 500-1,400 pairs of herring gulls and 5-25 pairs of great black-backed gulls nested in the area from 1982-1984, making Storehouse one of the largest gull colonies on Long Island. Comparable numbers of gulls were present in the area in 1977. In 1985, there were no great black-backed gulls nesting in this area and only 100 breeding pairs of herring gulls. The gull population may be decreasing as a result of vegetative succession in the nesting areas. The unusual concentrations of wildlife at Storehouse attract occasional human use for birdwatching, photography, and nature study, of county-level significance.

IMPACT ASSESSMENT:

The Storehouse bird populations would be most adversely affected by habitat modification and human intrusion. Extensive clearing of vegetation in the area, especially the pine stands, would probably eliminate the heron rookery. On the other hand, natural succession in open sandy areas would reduce the area suitable for gull nesting, although much other suitable habitat exists in the vicinity. Any significant disturbance of the birds nesting at Storehouse, including increased recreational use of the area, should be avoided during the nesting period, which extends from April through early August.

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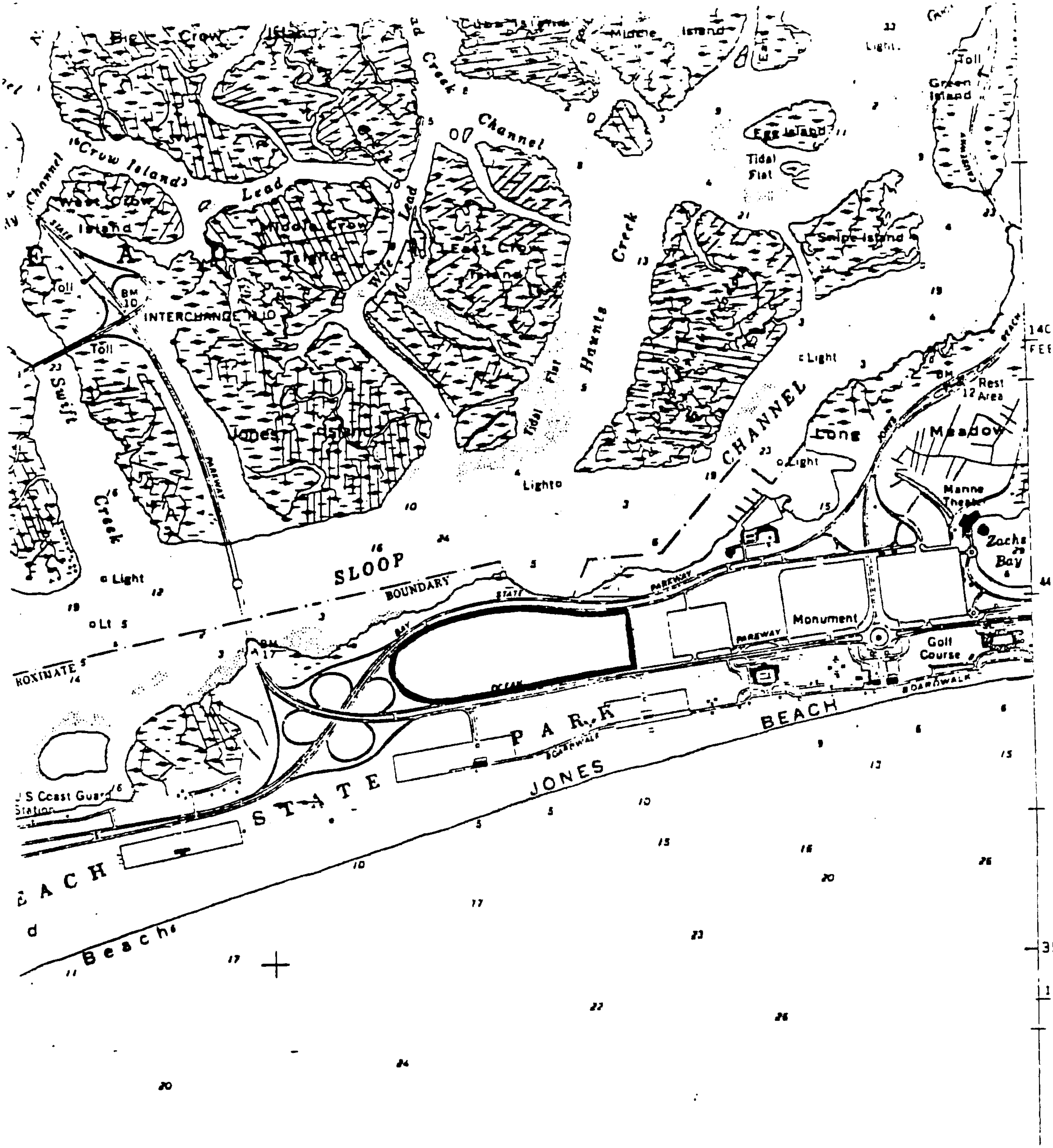

Quad: Jones Inlet, NY
Area Name: Storehouse, Jones Beach State Park
Habitat Boundary ———
Page 1 of 1

[illegible] & Wildlife Habitat Rating Form

Name of Area: West End (Jones Beach State Park)

County(ies): Nassau

Town(s): Hempstead

FEB. 1 6 1987

7.5' Quadrangle(s): Jones Inlet, NY

	(IS) Individual Score		(R) Replace-ability		(ISxR) Final Score
ECOSYSTEM RARITY (ER):	40	x	1.0	=	40.0
Undeveloped segments of marine barrier beach habitat are rare in New York: rarity is diminished somewhat by roadways and recreational use. Geometric Mean: 25 x 64 = 40					
SPECIES VULNERABILITY (SV):	37.5	x	1.0	=	37.5
Common tern (T) and piping plover (T) nesting. Northern harrier (T) may nest in this area but further documentation needed. Additive Division: 25 + 25/2 = 37.5					
HUMAN USE (HU):	20	x	1.0	=	20.0
Research activities are significant at a level between the northeastern United States and the State of New York; birdwatching locally important. Geometric Mean: 16 x 25 = 20					
POPULATION LEVEL (PL):	16	x	1.0	=	16.0
Concentrations of nesting terns and skimmers significant at the State level.					

REPLACEABILITY (R): 1.0

Ability to replace population level is uncertain and cost of replacement would be prohibitive.

SIGNIFICANCE = [(ERxR) + (SVxR) + (HUxR) + (PLxR)] = 113.5

SIGNIFICANT COASTAL FISH AND WILDLIFE HABITAT

PROJECT DESCRIPTION

WEST END (JONES BEACH STATE PARK)

LOCATION AND DESCRIPTION OF HABITAT:

West End is at the westernmost tip of a 17 mile long barrier island that runs along Long Island's southern shore. West End is located in Jones Beach Park State Park south of Jones Inlet. This approximate 200 acre habitat is in the Town of Hempstead, Nassau County (7.5' Quadrangle: Jones Inlet, N.Y.). The fish and wildlife habitat is primarily the sparsely vegetated dune areas located behind the public beach and among the roadways at West End, extending to Jones Inlet.

FISH AND WILDLIFE VALUES:

Relatively undeveloped barrier island habitats such as this are rare in New York State, although they do occur elsewhere on Long Island. West End provides important habitat for breeding colonies for several endangered and threatened shorebird species. During the period between mid-April through July, common terns (T) and black skimmers nest in the sand and grassy mounds among the dunes located in the vicinity of the entrance roads. These areas are probably selected as nesting areas because they receive minimal disturbance by humans. In 1981, there were an estimated 1,018 nests of common terns and 16 nests of black skimmers observed. For the years 1982, 1983, 1984 and 1985 there were an estimated 1400, 350, 230 and 130 pairs of nesting common tern respectively. In 1984 and 1985, an estimated 130 and 56 pairs of black skimmers were observed in the area. Nesting tern and skimmer populations of this size are generally uncommon in New York State. Piping plovers (T) were also seen along the oceanside edge of the area in 1984 and 1985 and probably nest here. Northern harrier (T) was listed as a possible breeder in this area in 1983. There are no significant human use activities specifically associated with the wildlife resources at West End. Portions of Jones Beach State Park provide important access for mobile sportsfishermen who use off-road vehicles to reach the valuable surf fishery at this site.

IMPACT ASSESSMENT:

Any activity affecting the tern and skimmer colonies, including human intrusion and the introduction or attraction of mammalian predators, during the critical nesting period from mid-April through July would adversely impact these species. At present, recreational use of the back dune areas limits the suitability of much of the area for bird nesting. Reduction or loss of the area presently utilized by the nesting colonies could significantly affect the bird populations in this vicinity. Traditional uses on the lower beach such as pedestrian traffic or mobile sportsfishing are generally compatible with the use of the upper beach and dune area by nesting shorebirds. Specific bird nesting areas should be fenced annually at these sites to restrict human disturbance. Although nesting sites may change from year to year, human disturbance of the upper beach and dunes (above the spring high tide line) must be avoided in order to preserve these sites' value as a nesting habitat. Any potential impacts in this area should be reviewed for compatibility with research programs that are being conducted here.

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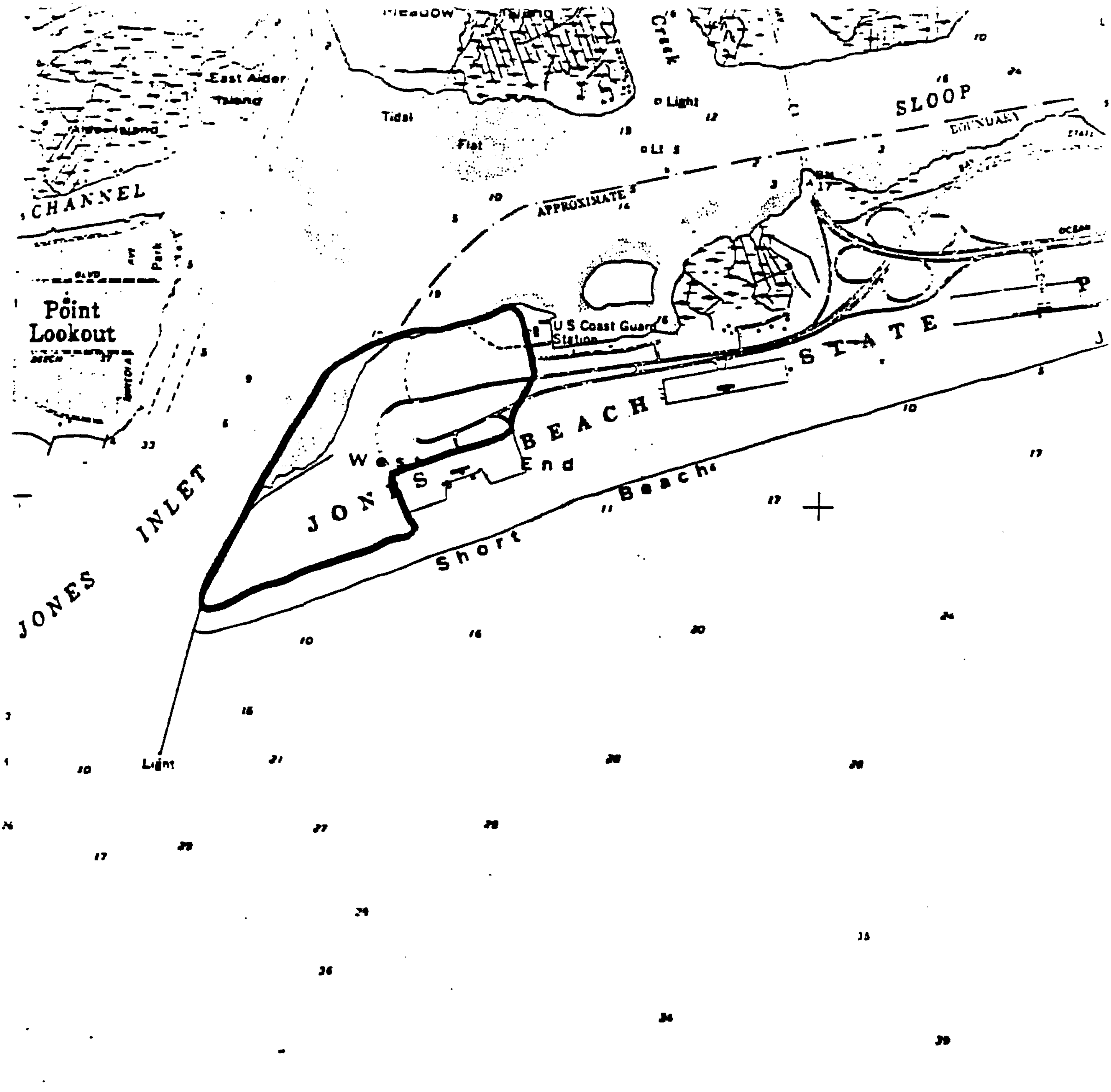

Quad: Jones Inlet, N.Y.
Area Name: West End (Jones Beach S.P.)
Habitat Boundary
Page 1 of 1

COASTAL FISH AND WILDLIFE HABITAT RATING FORM

Name of Area: Middle Hempstead Bay

County(ies): Nassau

FEB. 1 6 1987

Town(s): Hempstead

7.5' Quadrangle(s): Freeport, NY; Jones Inlet, NY; Lawrence, NY; Lynbrook, NY

	(IS) Individual Score		(R) Replace-ability		(ISxR) Final Score
ECOSYSTEM RARITY (ER): One of the largest, undeveloped, coastal wetland ecosystems in New York State.	64	x	1.2	=	76.8
SPECIES VULNERABILITY (SV): Common tern (T) nesting and diamondback terrapin (SC) present. Additive division: 25 + 16/2 = 33.	33	x	1.2	=	39.6
HUMAN USE (HU): One of the most important waterfowl hunting areas on Long Island; environmental education activities of county-level significance. Additive division: 9 + 4/2 = 11.	11	x	1.2	=	13.2
POPULATION LEVEL (PL): Wintering waterfowl concentrations (brant, especially) of statewide significance.	16	x	1.2	=	19.2

REPLACEABILITY (R): Irreplaceable — 1.2

SIGNIFICANCE = [(ERxR)+(SVxR)+(HUxR)+(PLxR)] = 148.8

SIGNIFICANT COASTAL FISH AND WILDLIFE HABITAT

PROJECT DESCRIPTION

MIDDLE HEMPSTEAD BAY

LOCATION AND DESCRIPTION OF HABITAT:

Middle Hempstead Bay ("Middle Bay") is located along the south shore of Long Island, between the Village of Island Park and the Meadowbrook State Parkway, in the Town of Hempstead, Nassau County (7.5' Quadrangles: Freeport, N.Y.; Jones Inlet, N.Y.; Lawrence, N.Y.; and Lynbrook, N.Y.). This approximate 5,000 acre area is generally defined by the mean high water elevation on all sides, except just west of Jones Inlet, where it extends to the center line of the Reynolds and Sloop Channels. The fish and wildlife habitat is the entire bay, which includes extensive areas of undeveloped salt marsh, tidal flats, dredge spoil islands, and open water. Water depths in the bay vary from less than 6 feet (below mean low water) in the natural creeks and bays, to over 30 feet in portions of some dredged navigation channels. Tidal fluctuations in the bay average approximately 3.6 - 4.2 feet. Most of Middle Hempstead Bay is owned by the Town of Hempstead and is managed as a wetland conservation area, with allowance for mosquito control activities (ditching). The bay is surrounded by residential development and small craft harbor facilities, except on the east side, which is bordered by undeveloped right-of-way for the Meadowbrook Parkway.

FISH AND WILDLIFE VALUES:

Middle Hempstead Bay comprises approximately one-third of the vast Hempstead Bays wetland complex. The bay represents one of the largest undeveloped coastal wetland ecosystems in New York State. This highly diverse area is important to fish and wildlife throughout the year. Common terns (T) nest in many locations throughout the bay, including Garrett Marsh, East Channel Islands, North Cinder Island, Gull Island, and Cinder Island. In 1984 and 1985 a total of approximately 575 pairs and 325 pairs, respectively, of common terns were observed nesting in Middle Bay. Middle Bay is also inhabited by a variety of nesting heron species, including snowy egret, great egret, black-crowned night heron, and green-backed heron. This area is also one of the few locations on Long Island where yellow-crowned night heron and tri-colored heron have been found nesting. Heronries have been located on South Pine Marsh, on Smith Meadow, south of Little Swift Creek, on Meadow Island, along the Loop Parkway (1986), and possibly on High Meadow Island. Nests are usually placed in woody vegetation which has become established on abandoned dredge spoil deposits. As of 1977, Smith Meadow contained regionally significant nesting concentrations of snowy egret, black-crowned night heron, and glossy ibis, with estimates of 165, 95, and 53 pairs, respectively. Other species nesting in Middle Hempstead Bay include Canada goose, black duck, mallard, herring gull, American oystercatcher, clapper rail, willet, gull-billed tern, fish crow, marsh wren, sharp-tailed sparrow, and seaside sparrow. The salt marshes, intertidal flats, and shallows in this area are used extensively as feeding areas for birds nesting here and for many other species during migration (shorebirds in particular). Middle Hempstead Bay is one of the most important waterfowl wintering areas (November - March) on Long Island. Mid-winter aerial surveys of waterfowl abundance for the ten year period 1975-1984 indicate average concentrations of over 6,600 birds in the bay each year (26,855 in peak year), including approximately 4,200 brant (10,880 in peak year), 2,000 scaup (17,750 in peak year), and 230 black ducks (975 in peak year), along with lesser numbers of bufflehead, common goldeneye, canvasback, mallard, Canada goose, oldsquaw, and red-breasted merganser. Middle Bay supports the largest wintering concentration of brant in New York State. Waterfowl use of the bay during winter is influenced in part by the extent of ice cover each year. Generally, brant and geese feed in open water areas through midwinter, while later in spring (prior to migration), the birds feed extensively in the salt marshes. Concentrations of waterfowl also occur in the area during spring and fall migrations (March - April and October - November, respectively). All of Middle Bay is open to the public for waterfowl hunting, and the area supports regionally significant hunting pressure.

In addition to having significant bird concentrations, Middle Hempstead Bay is a productive area for marine finfish, shellfish, and other wildlife. The bay serves as a nursery and feeding area (from April - November, generally) for bluefish, winter flounder, summer flounder, kingfish, weakfish, blackfish, scup, blue claw crab, and forage fish species, such as Atlantic silverside, pipefish, and sticklebacks. As a result of the abundant fisheries resources in the bay, and its proximity to the New York metropolitan area, Middle Bay receives heavy recreational fishing pressure, of regional significance. The bay is inhabited by hard clams, soft clams, ribbed mussels, and blue mussels, but most of the bay waters are not certified for shellfishing. There is considerable potential for harvesting young clams from the area for transplanting into commercial aquaculture areas. Diamondback terrapin (SC) nest among the salt marsh islands in the bay, and at the Oceanside Marine Nature Study Area. Muskrat populations in the area support a significant amount of trapping by local residents. Several facilities for environmental education are located around Middle Bay, providing nature study opportunities for many Nassau County residents.

IMPACT ASSESSMENT:

Any activity that would substantially degrade the water quality in Middle Hempstead Bay would adversely affect the biological productivity of this area. Most species of fish and wildlife would be affected by water pollution, such as chemical contamination (including food chain effects), oil spills, excessive turbidity, and waste disposal. Efforts should be made to improve water quality in the bay, including control of sewage discharges from recreational boats and upland sources. Alteration of tidal patterns in Middle Bay could have major impacts on the fish and wildlife communities present. No new navigation channels should be excavated within the area. Dredging to maintain existing boat channels in the bay should be scheduled in late summer and fall to minimize potential impacts on fish and shellfish and to allow for spoil disposal when wildlife populations are least sensitive to disturbance. Elimination of salt marsh and shallow areas, through excavation or filling, would result in a direct loss of valuable habitat area. Unregulated dredge spoil disposal in this area would be detrimental, but such activities may be designed to maintain or improve the habitat for certain species of wildlife. Nesting birds inhabiting the islands of Middle Bay are highly vulnerable to disturbance by humans from mid-April through July. Recreational use (e.g., boat landing, picnicking) of those islands which contain concentrations of nesting birds should be minimized during this period, through the use of annual posting or fencing. Construction of shoreline structures, such as docks, piers, bulkheads, or revetments, in areas not previously disturbed by development (i.e., natural salt marsh, tidal flats, or shallows), would result in the loss of productive areas which support the fish and wildlife resources of Middle Hempstead Bay.

KNOWLEDGEABLE CONTACTS:

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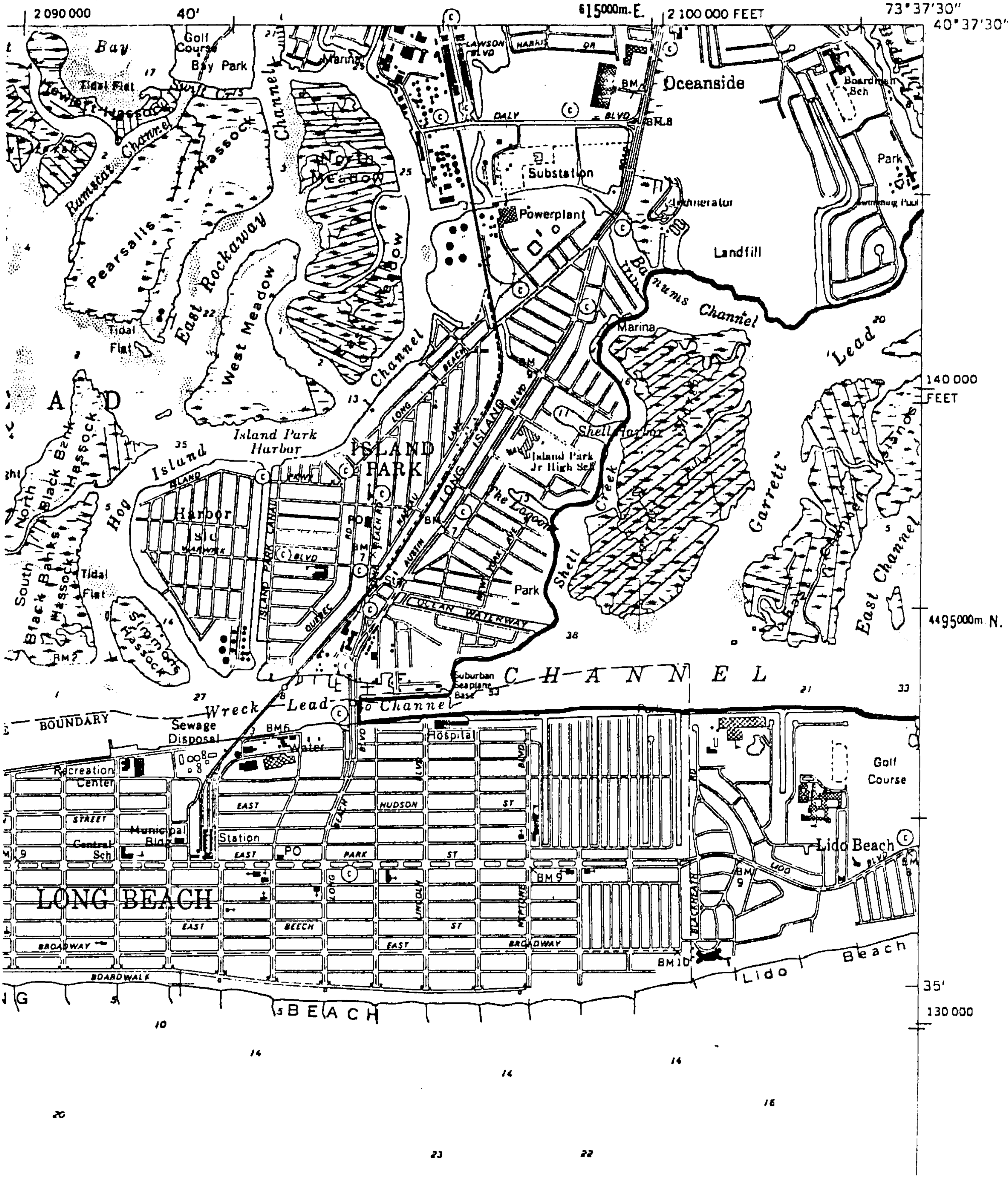
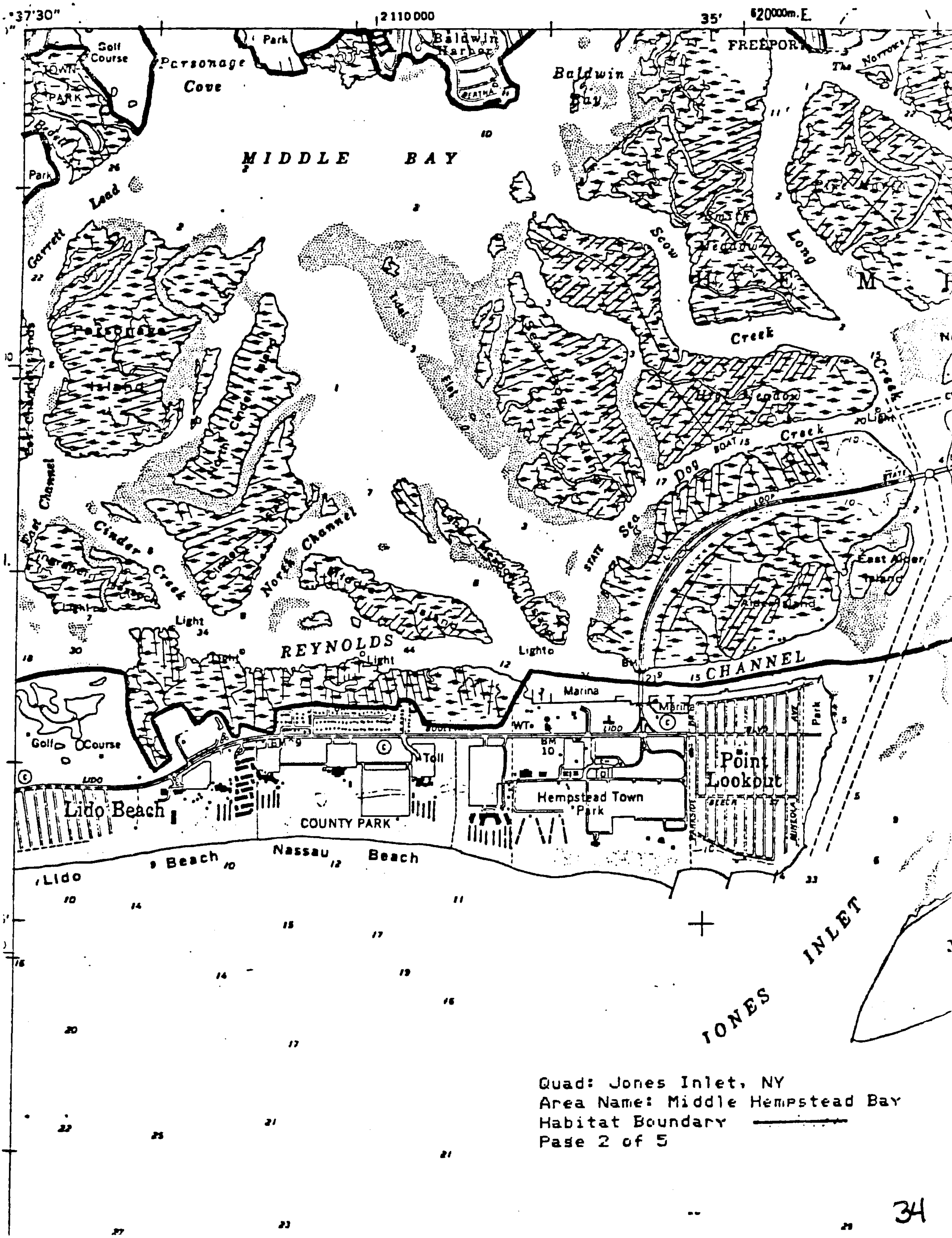


Quad: Lawrence, NY
Area Name: Middle Hempstead Bay
Habitat Boundary: ————
Page 1 of 5



Quad: Jones Inlet, NY
Area Name: Middle Hempstead Bay
Habitat Boundary
Page 2 of 5

Prepared and published in 1981 by the New York State Department of Transportation, in cooperation with the U.S. Department of Transportation, Federal Highway Administration.

Map base from 1969 U.S. Geological Survey 7.5-minute quadrangle

Map revisions made using 1980 aerial photography, construction plans, official records and other sources. Features revised include: highways and other transportation facilities; civil boundaries; recreation sites; hydrography; and buildings. Grey tint indicates intensely developed areas in which only landmark buildings are shown.

Revisions may not comply with National Map Accuracy Standards.

Quad: Freeport, NY
Area Name: Middle Hempstead Bay
Habitat Boundary: ———
Page 3 of 5

10,000-foot ticks

New York State Department
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Quad: Freeport, NY
Area Name: Middle Hempstead Bay
Habitat Boundary: ———
Page 4 of 5

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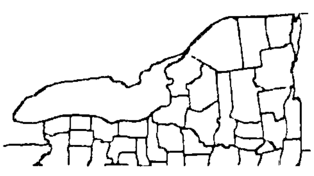

Polyconic projection. 1927 North American datum.

1000-meter ticks based on the New York Transverse Me
Between 72° and 78° West Longitude, this grid is identical to Zone 18 of the
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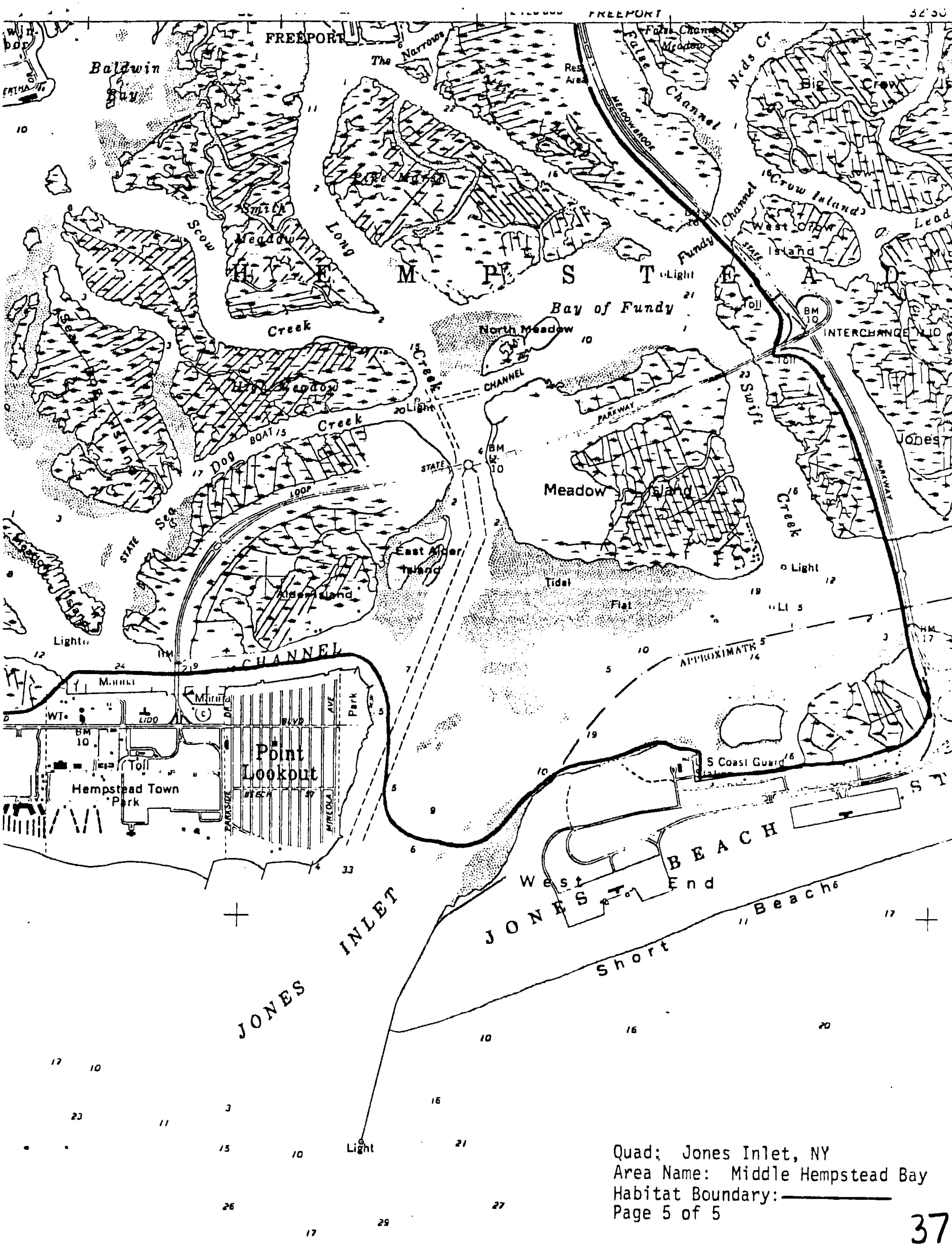

Quad: Jones Inlet, NY
Area Name: Middle Hempstead Bay
Habitat Boundary: ————
Page 5 of 5

REFERENCE NO. 23

Summary of the Hydrologic Situation on Long Island, New York, as a Guide to Water-Management Alternatives

By O. L. FRANKE *and* N. E. McCLYMONDS

HYDROLOGY AND SOME EFFECTS OF URBANIZATION ON LONG ISLAND, NEW YORK

GEOLOGICAL SURVEY PROFESSIONAL PAPER 627-F

Prepared in cooperation with the New York State Department of Conservation, Division of Water Resources; the Nassau County Department of Public Works; the Suffolk County Board of Supervisors; and the Suffolk County Water Authority

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UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON : 1972

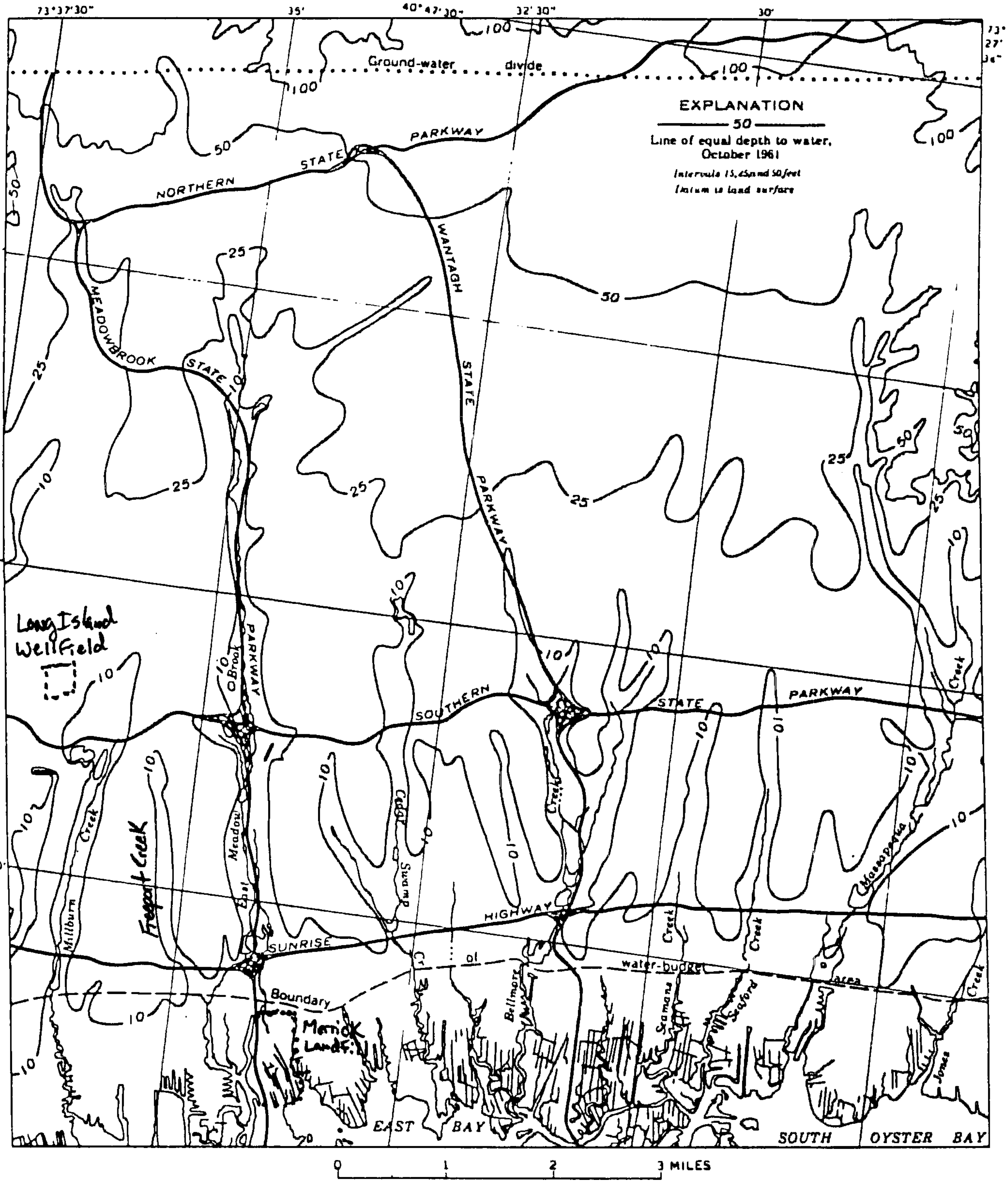


FIGURE 7.—Depth to the water table in southeastern Nassau County in October 1961.

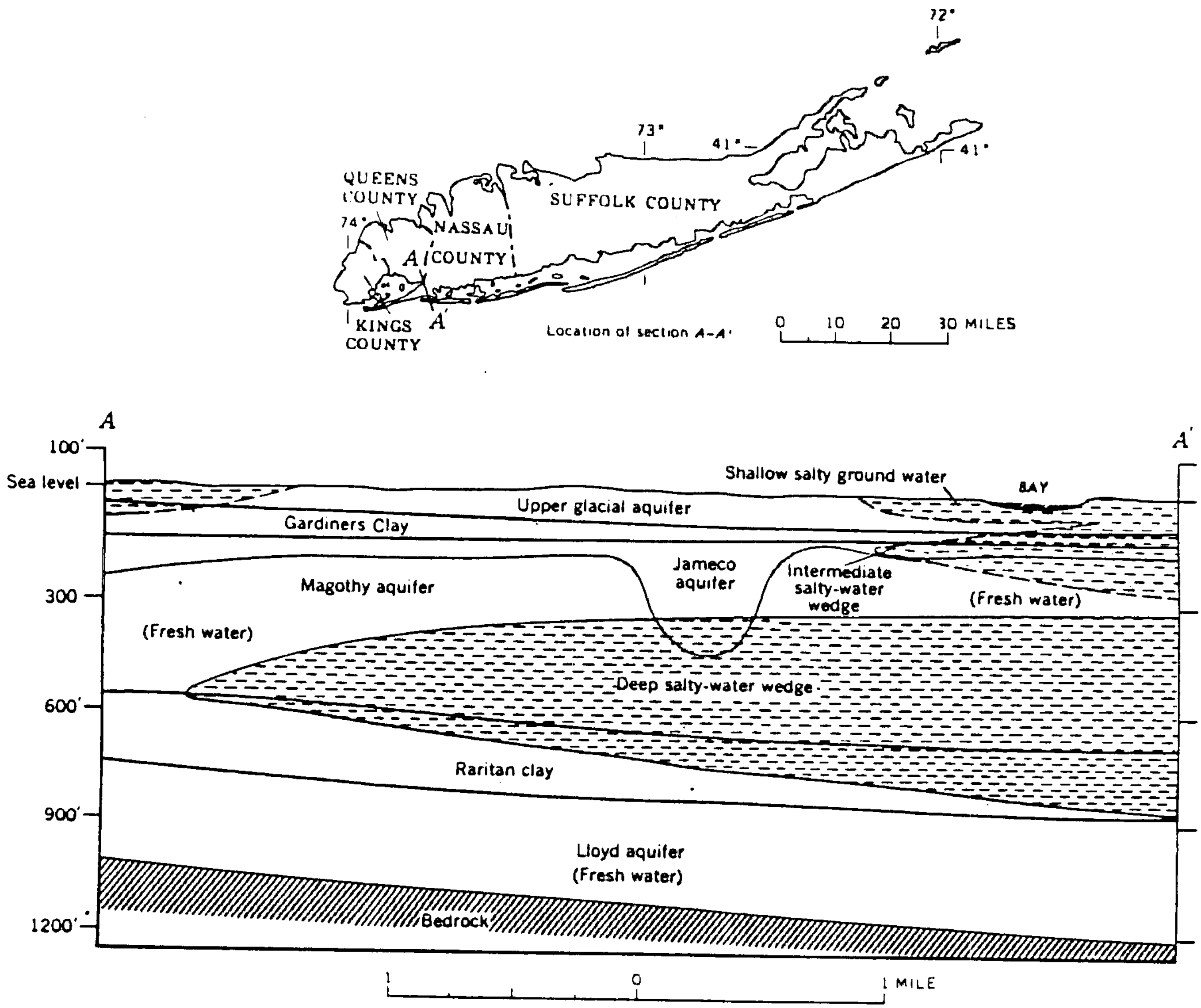


FIGURE 10.—Occurrence of salty ground water in southwestern Nassau County, in 1961. Adapted from Lusczynski and Swarzenski (1966, pl. 3).

The top of the bedrock surface, which outcrops in western Queens County, dips southeast on the average about 65 feet per mile, or slightly less than 1°, to an estimated depth of about 2,000 feet in south-central Suffolk County (fig. 11). The number of control points on the bedrock surface, particularly in Suffolk County, is small; therefore, the surface undoubtedly is more irregular than is indicated in figure 11.

For practical purposes the bedrock surface is the impervious bottom of the ground-water reservoir. Hydraulically, therefore, the top of the bedrock is a stream surface; ground water flows parallel to the bedrock and not across it, and equipotential lines or surfaces intersect the bedrock at right angles.

Generally, the flowing parts of the streams on Long Island are ground-water drains, and the ground water continually discharges into these parts under natural conditions. Therefore, in relation to the ground-water reservoir, the streams are discharging potential boundaries. The potential at a given point on the stream is equal to the altitude of the stream at that point. Thus, the potential along the stream channel varies continuously from the altitude of start of flow of the stream to the altitude of the surrounding bay or ocean.

The approximate location and altitude of the points of start of flow for several streams in June 1967 are shown in figure 3. Because ground-water levels and

TABLE 7.—*Relation of depth to the water table and average time lag in response to recharge in till-covered areas of northeastern Nassau County, Long Island, N.Y.*

[After Isbister (1966, table 10)]

Depth to water table (feet)	Average response time (months)	Depth to water table (feet)	Average response time (months)
0–10	0–1	80–100	5–6
10–25	1–2	100–120	6–7
25–40	2–3	120–140	7–8
40–60	3–4	140–160	8–9
60–80	4–5	160–180	9–10

feet often show a marked water-level response within hours or within a day or two after a large storm.

MOVEMENT WITHIN THE GROUND-WATER RESERVOIR

An idealized cross section of part of a ground-water reservoir is shown in figure 17. The dimensions of the cross section are similar to the Long Island ground-water reservoir in a north-south cross section south of the ground-water divide. The potential and flow lines in figure 17 were derived in part from an electric-analog model using graphite paper as the conducting medium (Wyckoff and Reed, 1935). In this model and in figure 17, the vertical exaggeration is about 15 to 1 compared to the Long Island ground-water reservoir. The water table was simulated by 10 discrete potential drops from the maximum potential in the system at the water-table divide (designated arbitrarily as 1000 in figure 17) to base level (zero potential or ground). No attempt was made to model a salt-fresh water interface.

The flow pattern in figure 17 was constructed for the following idealized conditions: (1) The flow was two dimensional, (2) the flow medium was homogeneous, (3) the upper boundary of the flow system (the water table) was a constant source of recharge, and (4) the lower boundary (impermeable bedrock) was a stream surface. Despite the idealized assumptions used to construct this flow net, several significant observations concerning the Long Island flow system can be made from the net. Except for narrow areas near the left- and right-hand margins of figure 17, the predominant directional component of flow is horizontal. In a model without vertical exaggeration the horizontal character of the flow would be even more pronounced. Furthermore, the flow line originating at the water-table divide follows a path nearest the bedrock and discharges farthest from the shoreline. The flow lines originating progressively shoreward of the water-table divide penetrate less deeply into the flow system and discharge nearer the shoreline.

Another significant observation from figure 17 is that, with the particular geometry and potentials fixed in the model, some discharge (electrical output) from the system occurs landward of the shoreline. Because this model is reasonably analogous to the flow system of the Long Island ground-water reservoir, the results suggest that some discharge mechanism may also be acting in this area in the prototype. On Long Island this discharge mechanism is largely associated with the flowing parts of the streams.

Seepage of ground water to the streams is a major factor in modifying the two-dimensional flow pattern in the shallow part of the ground-water reservoir in figure 17. East-west flow components that are perpendicular to the idealized flow section in figure 17 are clearly indicated in figure 18, which is a water-table contour map of the southeastern part of Nassau County. North of the flowing parts of the

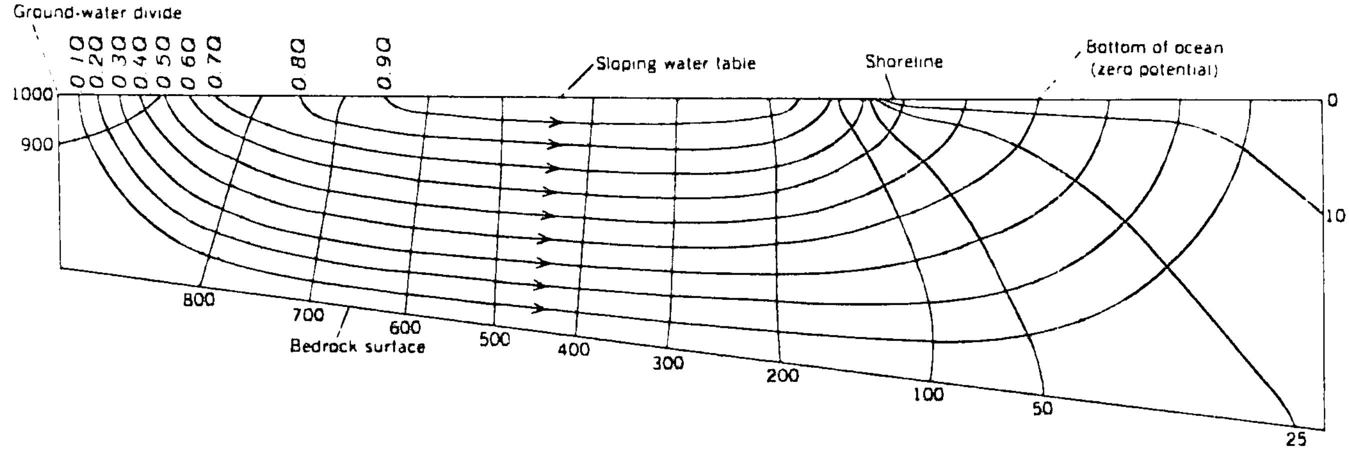


FIGURE 17.—Idealized cross section showing potential and flow lines in part of a homogeneous ground-water reservoir. Q is total discharge through system.

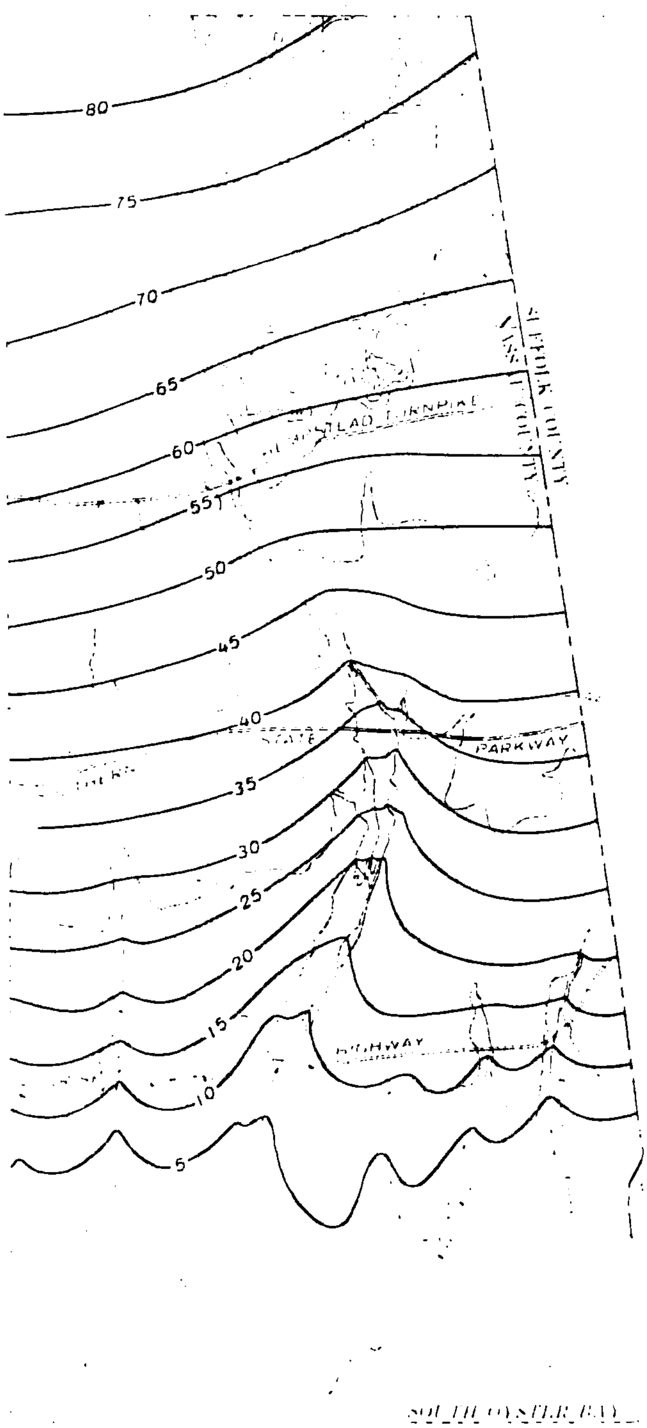


FIGURE 18.—Water-table contours near Massapequa Creek in October 1961.

streams, the water-table contours show relatively even and slight curvatures. In the neighborhood of their flowing parts, however, the water-table contours are bent sharply towards the streams, which clearly indicates that ground water discharges into them.

The ground-water system on Long Island can be divided into two general subsystems—a shallow circulating subsystem and a deep circulating subsystem. Ground water in the shallow subsystem, which is particularly well developed south of the main water-table divide, discharges mainly into the streams; ground water in the deep subsystem discharges into the bays, the Atlantic Ocean, and Long Island Sound. Flow paths in the deep subsystem range in length from one to several miles, and the flow is generally two dimensional (fig. 19). On the other hand, flow paths in the shallow subsystem range from a few feet to several thousand feet, and the flow is generally three dimensional.

Representative geohydrologic sections of the natural flow system in the northern and southern parts of Long Island are shown in figures 20 and 21, respectively. These sections show some of the principal geologic features of the ground-water reservoir that are responsible for modifying the idealized flow pattern shown in figure 17. The presence of almost horizontal and poorly permeable beds in the flow section tends to accentuate the horizontal components of flow, except near the ground-water divide and in discharge areas near the shorelines. Despite the obvious differences in detail, most of the major features of the flow pattern in figures 20 and 21 clearly are similar to those of the flow pattern in figure 17.

Profiles of heads in the major aquifers (fig. 22) show that a relatively small head difference occurs between the water table and the base of the Magothy aquifer as compared to the difference in head between the base of the Magothy aquifer and the Lloyd aquifer. This relatively large difference in head between the base of the Magothy aquifer and the Lloyd aquifer reflects the low hydraulic conductivity of the intervening Raritan clay, the principal confining layer of the Lloyd aquifer. Upward components of flow exist near the bottom of the Magothy aquifer seaward of the intersection of the piezometric surface at the bottom of the Magothy aquifer and the water table. Similarly, upward components of flow exist seaward of the intersection of the piezometric surface of the Lloyd aquifer and the piezometric surface at the bottom of the Magothy aquifer.

Another modification of the idealized flow pattern in figure 17 is caused by the salty ground water that

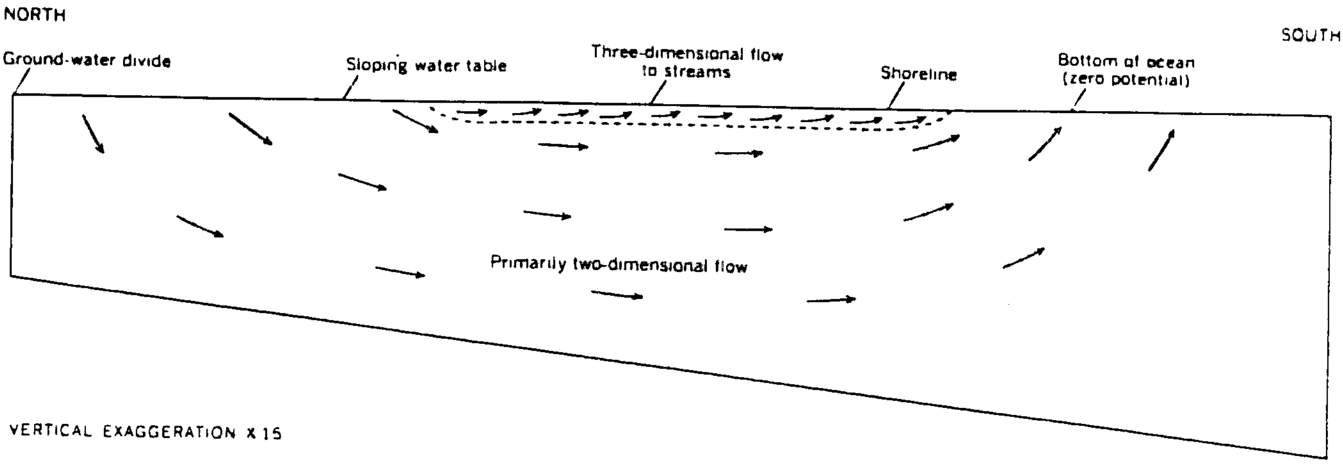
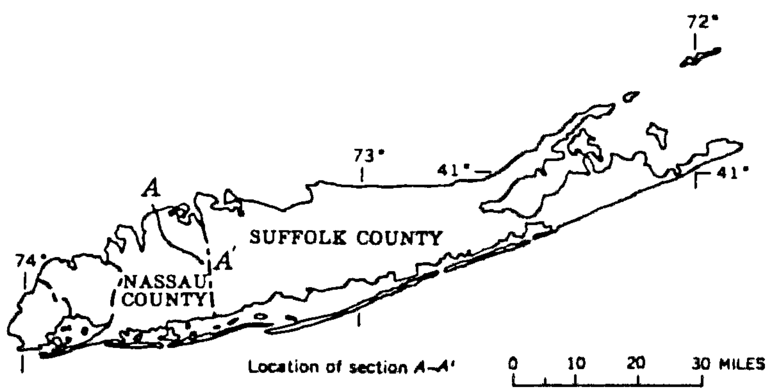


FIGURE 19.—Diagrammatic cross section of the southern half of the ground-water reservoir showing the part of the reservoir with primarily two-dimensional flow and the part of the reservoir with three-dimensional flow to streams.



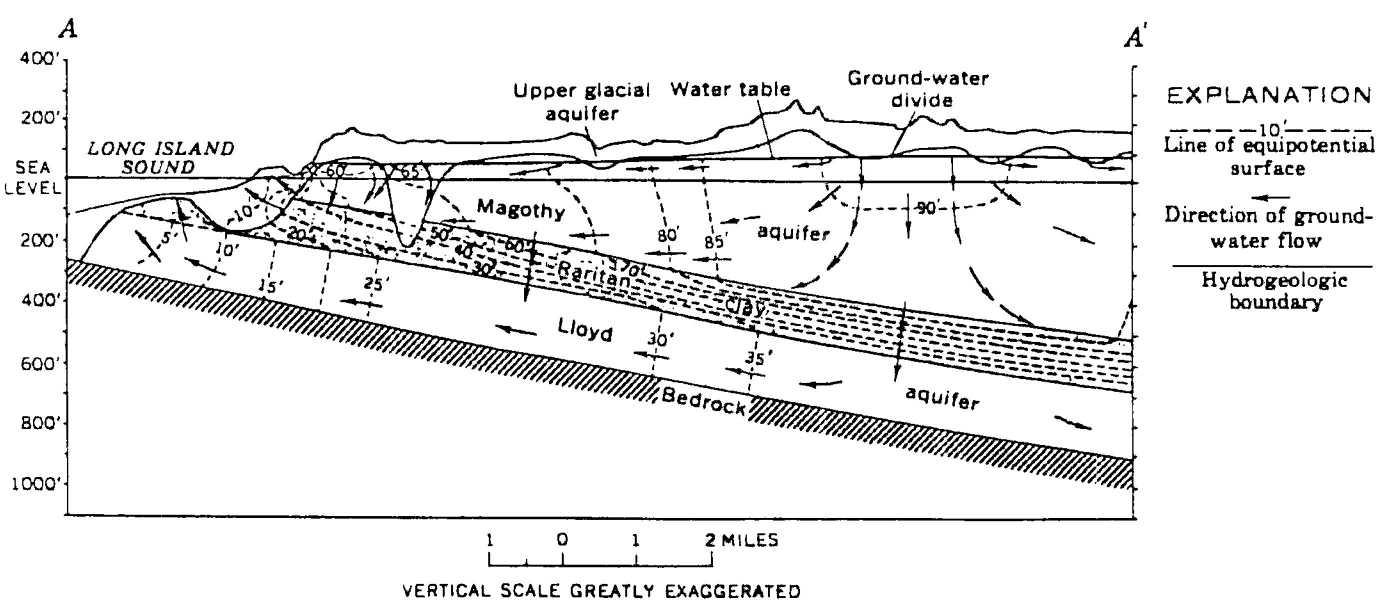


FIGURE 20.—Geohydrologic section of the ground-water reservoir in northeastern Nassau County in March 1961. Adapted from Isbister (1966, fig. 11).

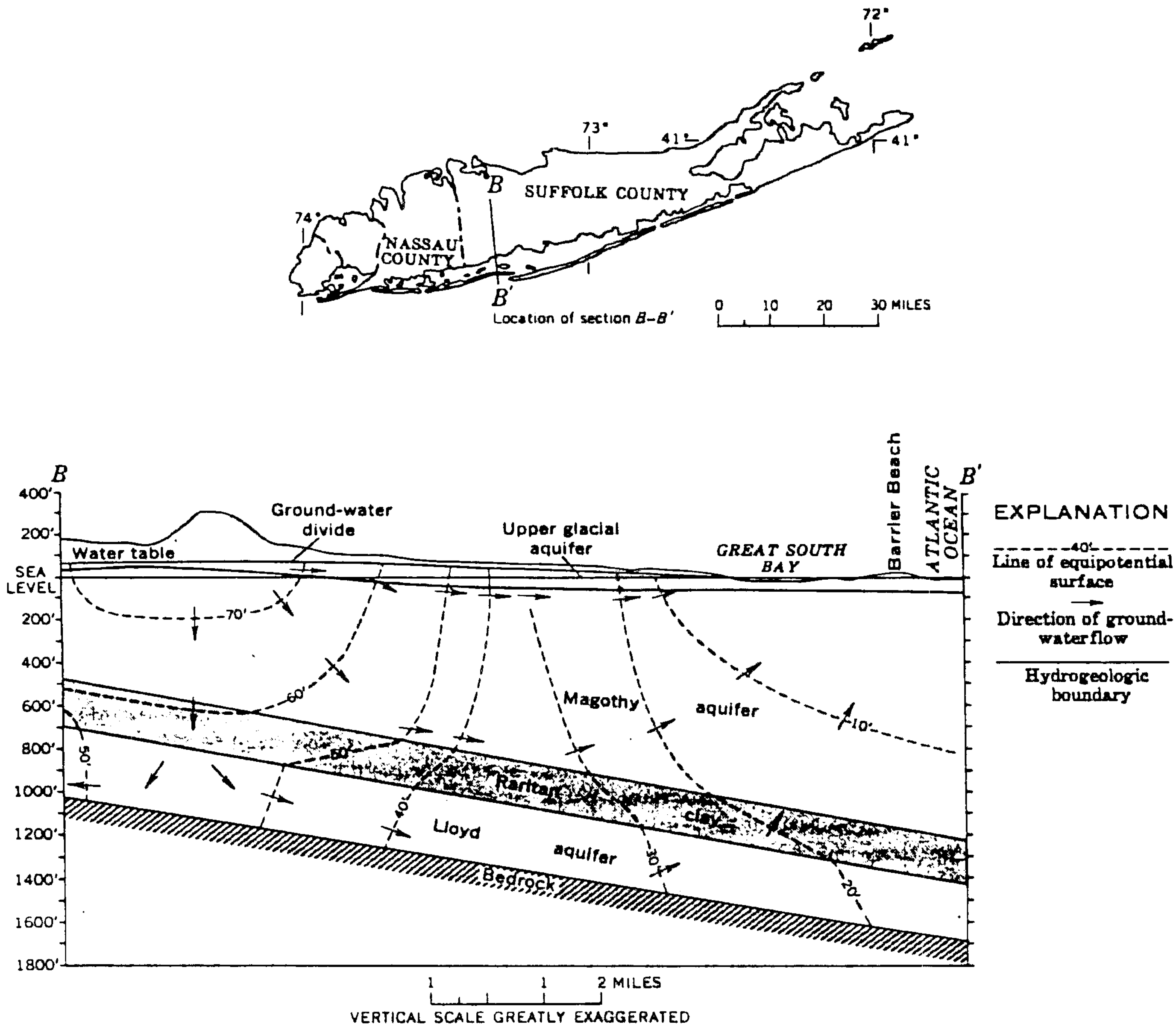


FIGURE 21.—Geohydrologic section of the ground-water reservoir in southwestern Suffolk County in October 1960. Adapted from Pluhowski and Kantrowitz (1964, fig. 13).

bounds the fresh ground-water reservoir of Long Island. The presence of the salty ground water results in several salt-fresh water interfaces at various depths in the Long Island ground-water reservoir. As stated previously, these interfaces are dynamic boundaries that change position in response to changes in head within the ground-water reservoir. The positions of these interfaces are undoubtedly at least partly related to the location of the relatively permeable and impermeable layers in the ground-water reservoir.

DISCHARGE FROM THE GROUND-WATER RESERVOIR

The main elements of discharge from the ground-water reservoir are seepage to streams and springs, ground-water evapotranspiration, and subsurface outflow (fig. 13).

STREAMFLOW AND SPRINGFLOW

Those aspects of streamflow that are emphasized in this report are the annual and daily streamflow from the water-budget area, streamflow in the near-

REFERENCE NO. 24

HYDROGEOLOGIC CONDITIONS
MERRICK AND OCEANSIDE
SOLID WASTE DISPOSAL SITES
TOWN OF HEMPSTEAD, NEW YORK

GERAGHTY
& MILLER, INC.
Consulting Ground-Water Geologists and Hydrologists
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HYDROGEOLOGIC CONDITIONS
MERRICK AND OCEANSIDE
SOLID WASTE DISPOSAL SITES
TOWN OF HEMPSTEAD, NEW YORK

INTRODUCTION

Geraghty & Miller, Inc. was retained by Charles R. Velzy Associates, Inc. to review hydrogeologic information and determine the need for ground-water monitoring at the Town of Hempstead's solid waste disposal sites.

The sites are located in the Town of Hempstead on the south shore of Nassau County, New York. The two sites, one at Merrick and the other at Oceanside, have nearly identical hydrogeologic characteristics and therefore, the conclusions reached during this study are applied to them collectively.

REGIONAL GEOLOGY

Detailed descriptions of formations present beneath southern Nassau County can be found in the report of Perlmutter and Geraghty (1963)[1]. Summary descriptions of five unconsolidated units pertinent to this study are given below and illustrated in Figure 1. Geologic logs of selected wells are included in the Appendix of this report.

The Upper Pleistocene deposits consist generally of glacial outwash materials and the "20-foot" clay. Highly permeable outwash deposits of fine to coarse sand and gravel are exposed at the surface and extend to depths between 45 feet and 65 feet. Beneath this outwash is a relatively thin bed of marine clay ("20-foot" clay) which forms a barrier between unconfined salty water above and confined fresh water below.

1) Geology and Ground-Water Conditions in Southern Nassau and Southeastern Queens Counties, Long Island, New York. Geological Survey Water-Supply Paper 1613-A.

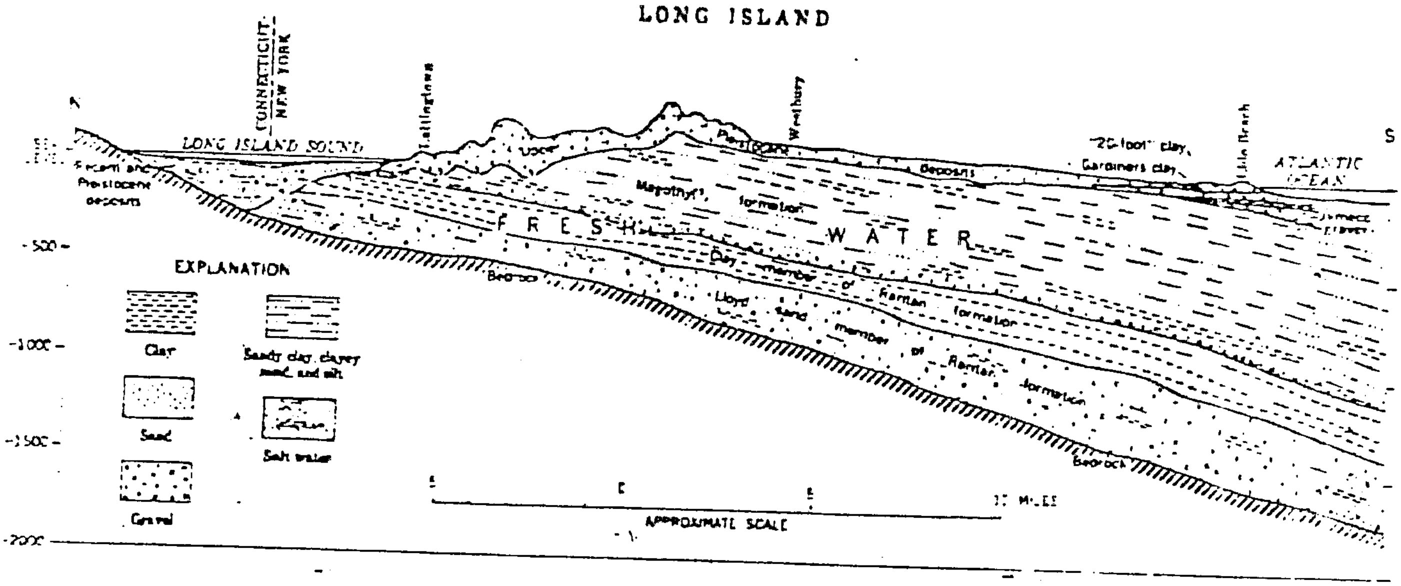
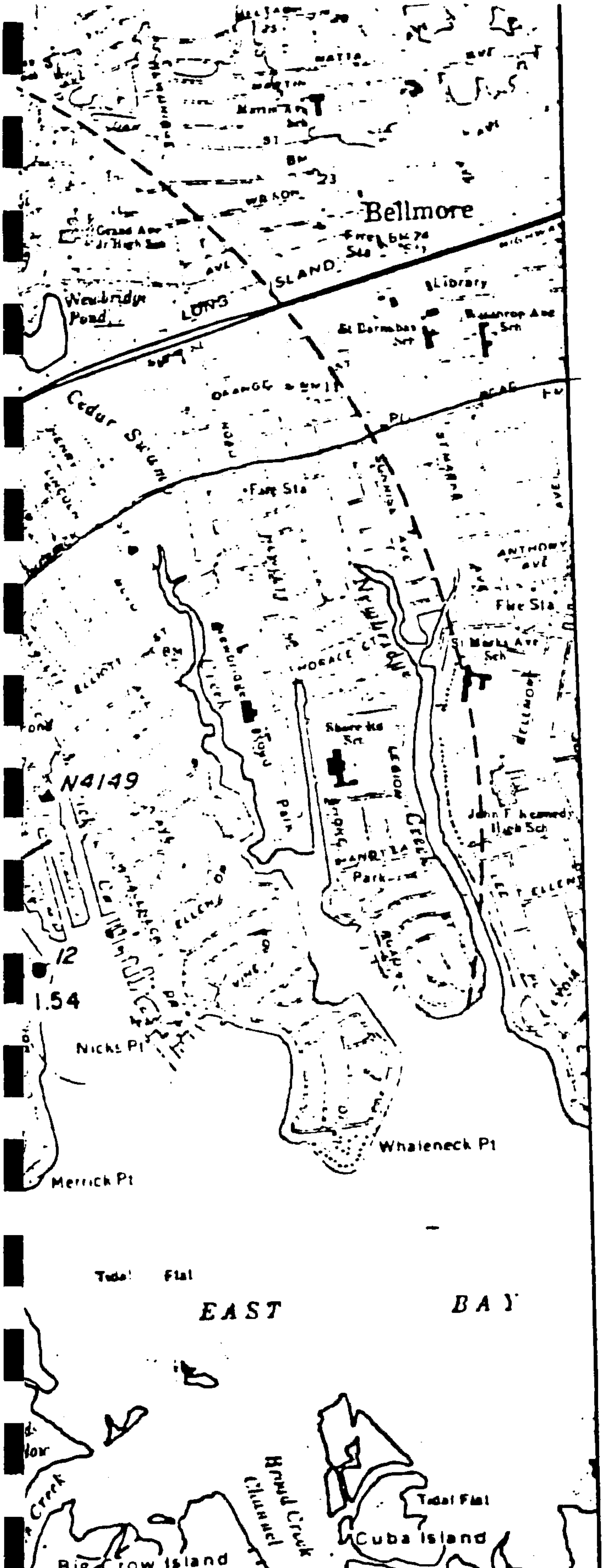


Figure 1. Generalized section showing stratigraphic units in central Nassau County, N.Y. (from Perlmutter and Geraghty, 1963).



EXPLANATION

Town of Hempstead Dept. of Sanitation Merrick Solid Waste Disposal Site.

9
7.61 U.S.G.S. monitor well location number with elevation of water table, in feet above mean sea level.

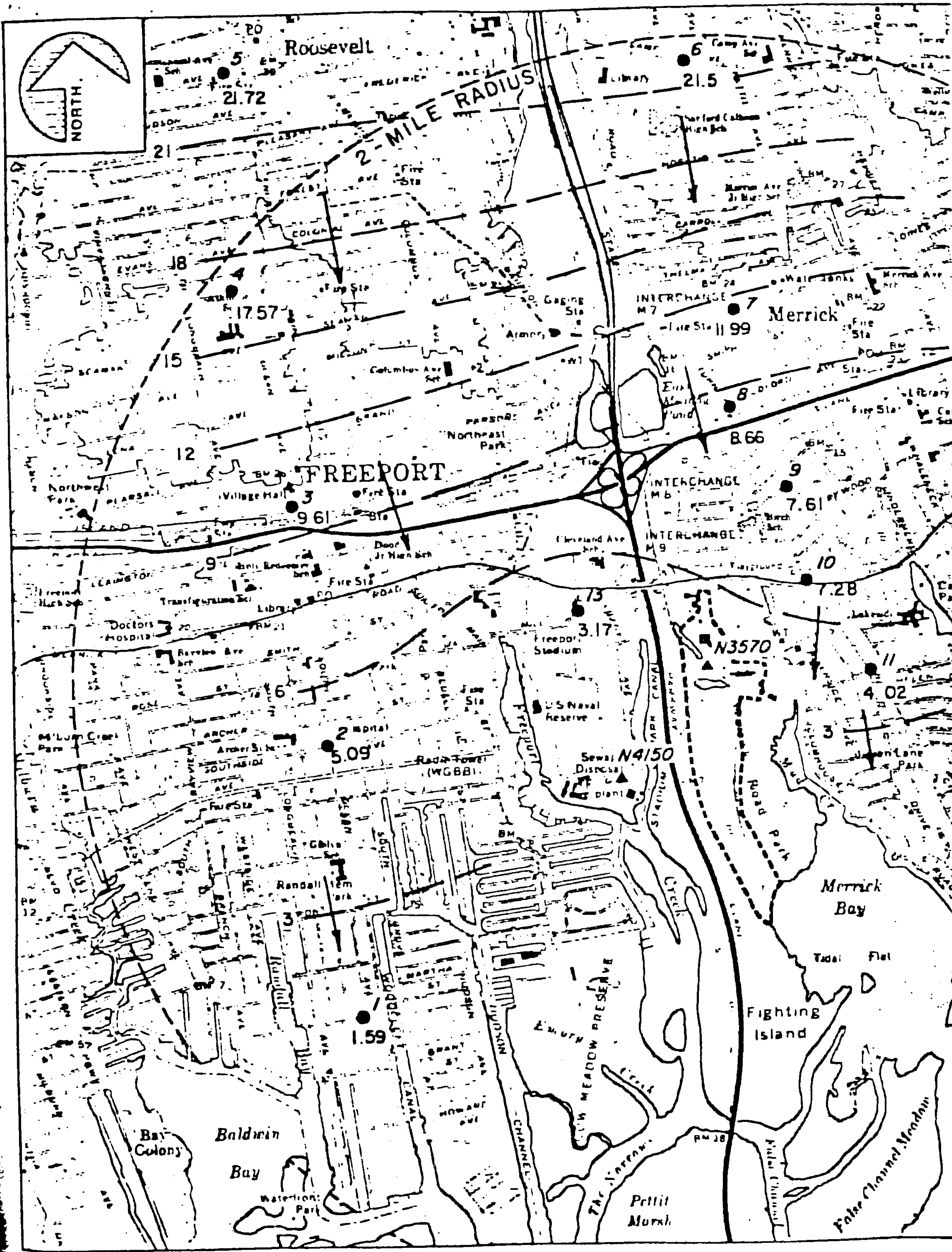
Water-table contour, in feet above sea level.

Approximate lateral direction of ground-water flow.

▲ Well location for which log is available

0 1/2 1 mile

SUBJECT	WATER-LEVEL ELEVATIONS FOR THE MERRICK, FREEPORT AREA MAY 27,28 & JUNE 3, 1980			
PREPARED FOR	CHARLES R. VELZY, ASSOCIATES, INC.			
Geraghty & Miller, Inc.	COMPILED BY BRUCE CARPENTER	SCALE 1"=2000'	FIGURE 2	
	PREPARED BY			
	PROJECT MGR DOUG MAC CALLUM	DATE JUNE 1981		



NORTH
2-MILE RADIUS
Roosevelt
Merrick
FREEPORT
Northeast Park
Village Hall
INTERCHANGE M 7
INTERCHANGE M 6
INTERCHANGE M 9
Doctors Hospital
Freeport Stadium
U.S. Naval Reserve
Sewer Disposal plant
N3570
N4150
Radio Tower (WGBB)
Randall Park
Merrick Bay
Tidal Flat
Fighting Island
Baldwin Bay
Bay Colony
Pettit Marsh
False Channel Meadow
The Narrows
Road Park
CHANNEL
CANAL
21.72
21.5
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11.99
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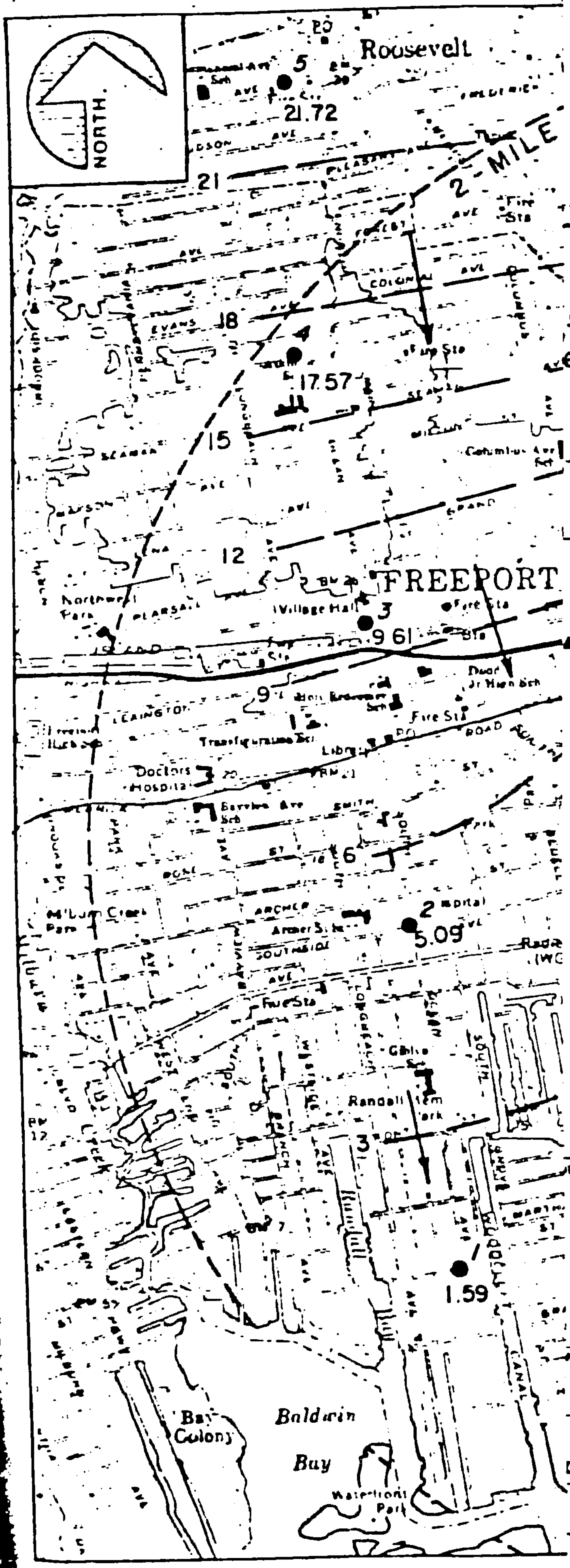
1.59



EXPLANATION

Town of Hempstead Dept. of Sanitation Merrick Solid Waste Disposal Site.

U.S.G.S monitor well location number with elevation of water table, in feet above mean sea level.

Water-table contour, in feet above sea level.

Approximate lateral direction of ground-water flow.

Well location for which log is available

0 1/2 1 mile

WATER-LEVEL ELEVATIONS FOR THE MERRICK, FREEPORT AREA MAY 27,28 & JUNE 3, 1980

PREPARED FOR CHARLES R. VELZY, ASSOCIATES, INC.

Geraghty & Miller, Inc.	COMPILED BY BRUCE CARPENTER	SCALE 1"=2000'	FIGURE 2
	PREPARED BY	DATE JUNE 1981	
	PROJECT MGR DOUG MAC CALLUM		

815-2

Present beneath the Pleistocene deposits near the western edge of the study area are the Gardiners clay and the Jameco gravel. The Jameco gravel, consisting primarily of coarse sand and gravel, is confined above by the low permeability Gardiners clay.

The Magothy (?) Formation, underlying all of these deposits and forming the principal confined freshwater aquifer for the area, contains alternating beds of mixtures of gravel, sand, silt and clay.

Merrick Site

The Merrick solid waste disposal site (see Figure 2) is situated on permeable sand and gravel outwash deposits approximately 40 feet thick. Beneath these deposits are about 18 feet of solid gray clay described earlier as the "20-foot" clay which confines the Magothy (?) formation immediately below it. Neither Gardiners clay nor Jameco gravel is present at this location.

The direction of lateral ground-water flow in the unconfined outwash deposits is shown in Figure 2. Thirteen U.S. Geological Survey monitoring wells are screened in this aquifer (see Table 1) and provided data used to contour the water table from which flow directions were derived.

It is probable that ground-water flow in the upper glacial outwash deposits has no significant vertical component. The presence of the "20-foot" clay retards flow between aquifers in either direction. Furthermore, data from the two cluster wells in the area (Wells 12 and 13) show that the vertical component of flow, however small, is upward rather than

Table 1. Observation Wells Monitored Quarterly by the U.S. Geological Survey in the Vicinity of the Merrick Landfill Site.

Location No.	U.S.G.S. Well No.	Total Depth	Date Installed	Diameter (inches)	Altitude of Measuring Point (feet above mean sea level)	Altitude of Water Level (feet above mean sea level)	Date of Measurement
1	1169	24.35	10/57	1¼	4.89	1.59	5/28/80
2	1168	27.88	8/37	1¼	13.74	5.09	5/28/80
3	1167	25.00	7/66	2	23.34	9.51	6/ 3/80
4	1166	27.44	8/37	1¼	28.89	17.57	6/ 3/80
5	1165	42.30	1/67	1¼	39.55	21.72	6/ 3/80
6	1184	31.10	7/69	1¼	32.30	21.51	5/27/80
7	1185	18.10	3/65	1¼	21.10	11.99	5/27/80
8	8847	26.40	4/72	1¼	15.63	8.66	5/27/80
9	1269	14.24	-	1¼	12.76	7.61	5/28/80
10	1186	23.40	8/60	1¼	10.11	7.28	5/28/80
11	1271	14.33	8/40	1¼	5.95	4.02	5/28/80
12	8648	28.45	3/70	1¼	8.67	1.54	5/28/80
12	8831*	97.40	12/71	4	8.42	5.02	5/28/80
13	8203	16.20	1/62	1¼	6.50	3.17	5/28/80
13	8204*	55.50	10/76	2	6.50	4.44	5/28/80

Note: All observation wells screened in unconfined glacial aquifer except where noted.

* confined water level from deep aquifer.

downward. As noted in Table 1, water levels (heads) in both cases are higher in wells tapping the confined aquifer than they are in wells tapping the shallow glacial aquifer.

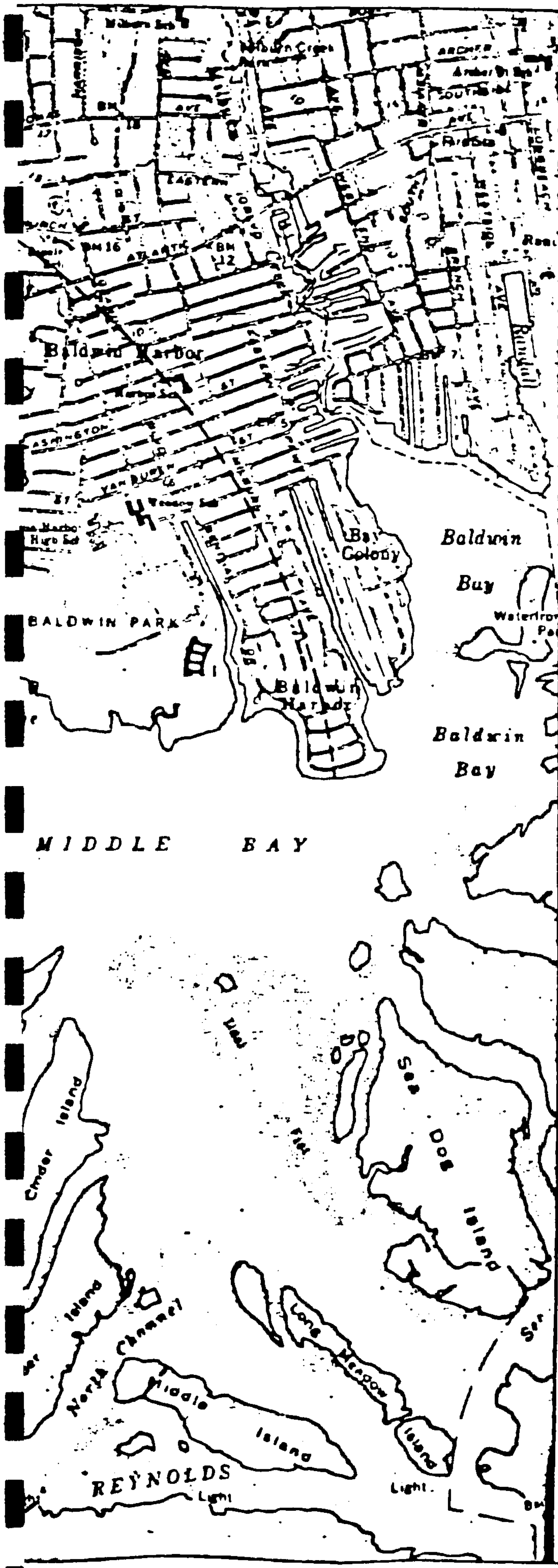
Within two miles of the site, twelve public supply wells are in operation at five locations, all north of Sunrise Highway. Each of these wells is over 500 feet deep and pumps from the deep confined aquifer (Magothy (?) formation). NYSDEC policy does not allow public supply wells to be located south of Sunrise Highway (on the mainland).

Oceanside Site

Approximately 50 feet of permeable sand and gravel deposits are present beneath this site (see Figure 3). The "20-foot" clay is 10 to 12 feet thick below these outwash deposits and acts as a confining bed for the deeper Magothy (?) formation. This clay also restricts vertical flow between the two aquifers. Gardiners clay is not present beneath the northern part of the site but may appear farther south.

Hydrogeologic conditions at the Oceanside site are similar to those at the Merrick site. Figure 3 shows the configuration of the water table in the area, and the approximate direction of ground-water flow in the upper glacial aquifer. Synoptic water levels for the shallow and deep wells of the two-well clusters (wells 1, 7, 8 and 9; Table 2) again show heads measured in wells tapping the Magothy (?) formation are greater than the heads in the unconfined glacial deposits. Again, the vertical component of ground water flow is upward rather than downward.

6



EXPLANATION

Town of Hempstead Dept. of Sanitation Oceanside Solid Waste Disposal Site.

Sanitary landfill area

4 ● 7.90 U.S.G.S. monitour well location number with elevation of water level, in feet above mean sea level.

6 — — Water-table contour, in feet above mean sea level.

← Approximate lateral direction of ground-water flow.

▲ Well location for which log is available

0 1/2 1 mile

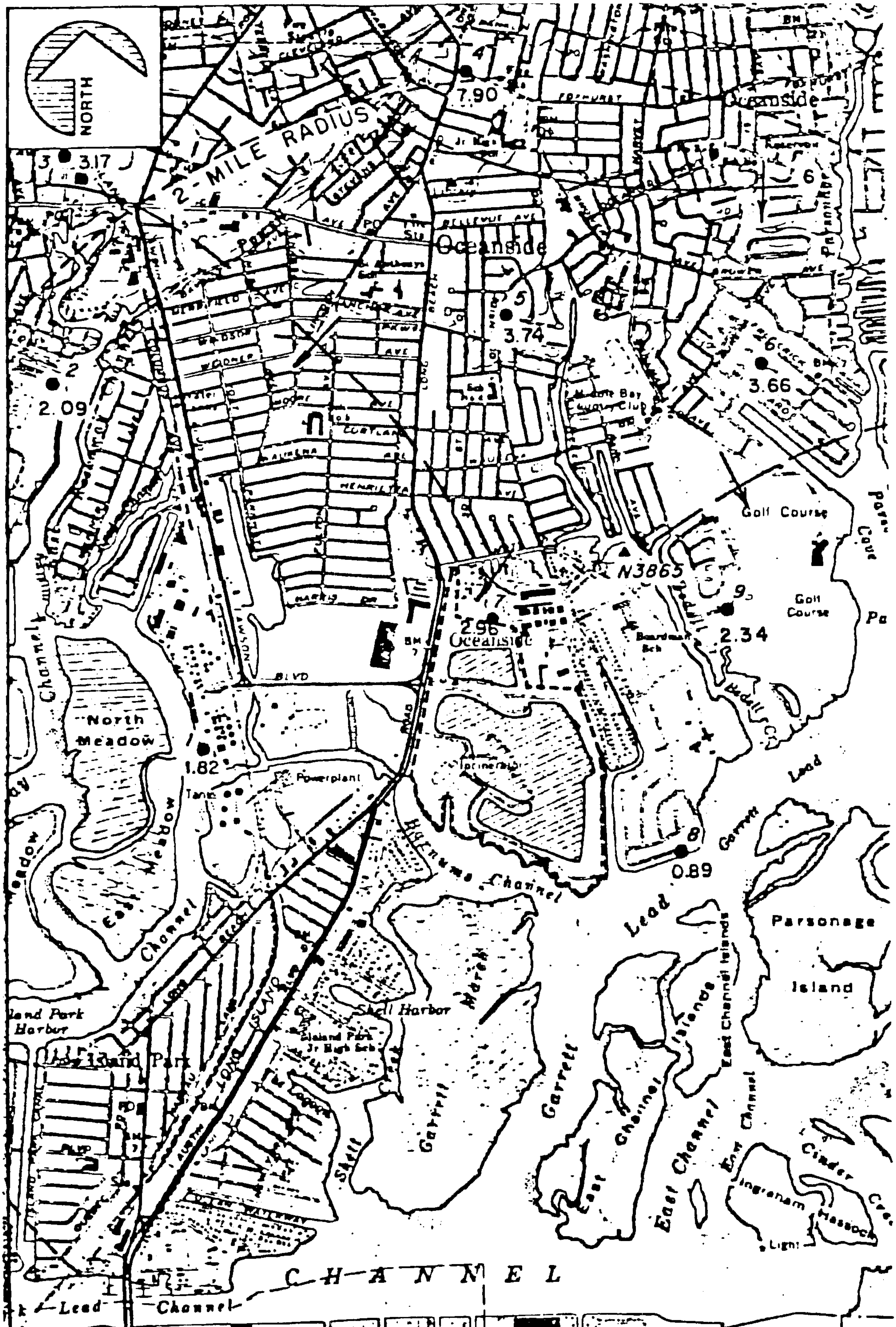
SUBJECT

WATER-LEVEL ELEVATIONS FOR THE OCEANSIDE AREA, MAY 29, 1980

PREPARED FOR

CHARLES R. VELZY, ASSOCIATES, INC.

Geraghty & Miller, Inc.	COMPILED BY BRUCE CARPENTER	SCALE 1"=2000'	FIGURE 3
	PREPARED BY		
	PROJECT MGR DOUG MAC CALLUM	DATE JUNE 1981	


NORTH
2-MILE RADIUS
Oceanside
3.17
7.90
3.74
3.66
2.09
1.82
2.96
2.34
0.89
N3865
Golf Course
North Meadow
Powerplant
Channel
Shell Harbor
Island Park Jr High Sch
Island Park Harbor
Garrett Marsh
Garrett Lead
East Channel Islands
East Channel
Parsonage Island
Ingraham Hassock
Light
CHANNEL
Lead
Channel
Hospital

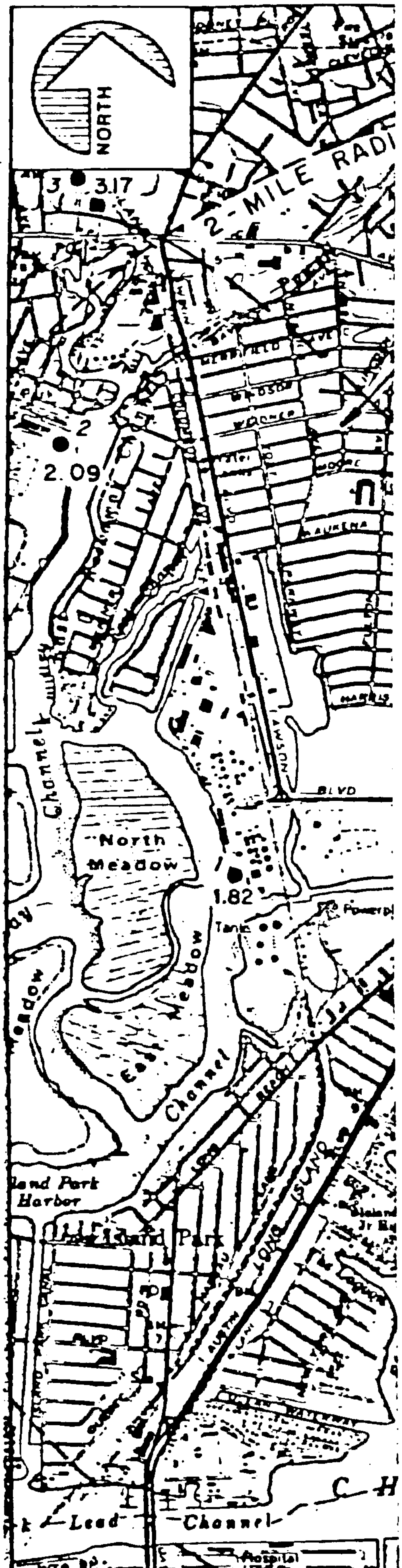

NORTH
2-MILE RADI
3
3.17
2
2.09
Channel
BLVD
North
Meadow
1.82
Tank
Channel
Lead
Channel
Hospital

Table 2. Observation Wells Monitored Quarterly by the U.S. Geological Survey in the Vicinity of the Oceanside Landfill Site.

Location No.	U.S.G.S. Well No.	Total Depth	Date Installed	Diameter (Inches)	Altitude of Measuring Point (feet above mean sea level)	Altitude of Water Level (feet above mean sea level)	Date of Measurement
1	8763 1)	129.80	1/71	4	5.51	3.89	3/23/76 2)
1	8750	40.05	11/70	1¼	5.62	1.82	3/23/76 2)
2	8647	23.50	2/70	1¼	5.07	2.09	5/29/80
3	1133	23.85	6/59	1¼	9.57	3.17	5/29/80
4	1440	29.65	10/57	1¼	18.33	7.90	5/29/80
5	1441	23.10	1/62	1¼	10.69	3.74	5/29/80
6	8634	28.80	10/69	1¼	6.39	3.66	5/29/80
7	8637	33.35	10/69	1¼	4.98	2.96	5/29/80
7	8770 1)	141.20	3/71	4	4.89	3.57	5/29/80
8	8788	40.80	4/71	1¼	7.34	0.89	5/29/80
8	8849 1)	91.20	4/72	4	7.70	3.32	5/29/80
9	8806 1)	454.80	8/71	4	6.49	5.49	5/29/80
9	8635	28.50	10/69	1¼	7.26	2.34	5/29/80

Note: All observation wells screened in unconfined glacial aquifer except where noted.

1) Confined water level from deep aquifer.
2) Well abandoned in 1976.

The Oceanside site is more than two miles south of Sunrise Highway. Thus, no public supply wells exist within a two-mile radius of the site.

FINDINGS AND CONCLUSIONS

1. Under present hydrogeologic conditions, leachate from the Merrick or Oceanside solid waste disposal sites cannot migrate to the deep confined aquifer (Magothy (?) formation). Two factors account for this. Geologic logs for wells in the area confirm the presence of the "20-foot" clay which ranges in thickness from 10 feet to about 25 feet. Furthermore, the head difference between the shallow unconfined aquifer and the deep confined aquifer indicates an upward component of flow.

2. The upper surface of the "20-foot" clay ranges from about 30 feet to nearly 70 feet below grade in the general area. It seems reasonable to assert that the bottom of each site is above the clay and that the clay has not been breached. Thus, a significant degree of protection is afforded.

3. Whether or not the present head difference between the two aquifers will prevail for an extended period of time is not known. However, changes are not likely to occur unless significant increases in pumpage take place.

4. The upper glacial aquifer is not for municipal water supplies. In fact, public supply wells are not permitted south of Sunrise Highway which is upgradient of the two sites. Therefore, it is impossible for either to affect municipal water supplies, and the installation of monitoring

wells for the purpose of detecting leachate migration is not necessary at this time.

Respectfully submitted,

GERAGHTY & MILLER, INC.

Nancy MacDermott
Hydrogeologist

Douglas R. MacCallum
Senior Scientist

APPENDIX

GEOLOGIC LOGS

Description	Thickness (feet)	Depth (feet below land surface)
N4149		
Recent Deposits:		
Fill	3	0 - 3
Bog	1	3 - 4
Upper Pleistocene Deposits:		
Sand, medium to very coarse, brown, and gravel.	34	4 - 38
Clay, solid, gray ("20 foot" clay)	11	38 - 49
Sand, fine to medium, clayey, gray and thin layers of gray solid clay.	14	49 - 63
Magothy (?) Formation:		
Sand, medium to coarse, gray, trace of gray clay, and lignite.	48	63 - 111
Sand, medium to coarse, gray and thin layers of gray solid clay.	10	111 - 121
Sand, fine to medium, clayey, gray, and thin layers of gray solid clay.	8	121 - 129
Sand, medium, gray.	51	129 - 180
Sand, fine to medium, gray, some thin layers of gray clay and lignite.	30	180 - 210
Clay, solid, gray.	10	210 - 220
Sand, fine to medium, gray, some coarse sand, and thin layers of gray solid clay.	14	220 - 234
Sand, fine to medium, gray, with some clay, and thin layers of gray solid clay.	24	234 - 258
Clay, solid, gray, some thin layers of gray fine to medium sand and silt.	10	258 - 268
Sand, fine to medium, gray, lignite.	10	268 - 278
Clay, sandy, gray.	4	278 - 282
Sand, fine to medium, gray, and lignite.	9	282 - 291

GEOLOGIC LOGS

Description	Thickness (feet)	Depth (feet below land surface)
N4149 (cont'd.)		
Clay, solid, dark gray, with some thin layers of fine to medium clayey sand.	29	291 - 320
Sand, fine, gray, with some clay, and thin layers of lignite.	22	320 - 342
Clay, solid, black.	14	342 - 356
Sand, fine to medium, gray, with some clay, and thin lignite layers.	64	356 - 420
Sand, fine, gray, with some silt and gray clay, and thin lignite layers.	37	420 - 457
Clay, sandy, gray, layers of solid clay, fine silty sand, and lignite.	45	457 - 502
Sand, medium, gray, and thin lignite layers.	17	502 - 519
Sand, fine to medium, gray, with some clay, and thin lignite layers.	19	519 - 538
Clay, solid, gray.	5	538 - 543
Sand, medium,gray, some fine and coarse grains, and trace of gray clay.	25	543 - 568
Sand, fine to medium, gray, with trace of gray clay, and some thin layers of solid clay and lignite.	50	568 - 618
Sand, medium, gray, some fine and coarse grains, trace of clay and lignite.	38	618 - 656
Clay, solid, gray, with thin lignite layers	22	656 - 678
Sand, fine to medium, with some gray clay.	36	678 - 714
Sand, medium to coarse, gray and gravel mixed with some clay, and layers of gray solid clay.	22	714 - 736
Clay, sandy, gray, with thin layers of solid clay.	9	736 - 745
Sand, medium to coarse, gray, and gravel, with layers of gray solid clay and sandy clay.	24	745 - 769

GEOLOGIC LOGS

Description	Thickness (feet)	Depth (feet below land surface)
N4149 (cont'd.)		
Clay, solid and silty, gray, with some very fine sand.	11	769 - 780
Sand, fine to medium, gray, with some coarse grains, and trace of clay.	20	780 - 800
Raritan Formation:		
Clay, silty and solid, gray.	15	800 - 815
Clay, sandy, gray, with layers of fine to medium clayey sand and lignite.	41	815 - 856
Clay, solid and silty, gray, with lignite layers.	22	856 - 878
N3570		
Upper Pleistocene Deposits:		
Loam and gravel.	3	0 - 3
Sand, medium to coarse; grit.	8	3 - 11
Sand, coarse, brown; grit and gravel.	22	11 - 33
Sand, medium to coarse, white and gravel.	7	33 - 40
Clay, solid, gray ("20 foot" clay)	18	40 - 58
Magothy (?) Formation:		
Sand, gravel, clay.	7	58 - 65
Sand, dirty white; grit and some clay.	13	65 - 78
Sand, fine to medium; grit and mica.	20	78 - 98
Sand, fine; mica; layers of wood and clay.	22	98 - 120
Sand, medium to coarse; grit and lumps of clay.	2	120 - 122
Sand, fine, white; mica; white clay.	9	122 - 131
Sand, very fine, gray; mica; lumps of clay.	18	131 - 149
Sand, very fine, white; clay.	2	149 - 151

GEOLOGIC LOGS

Description	Thickness (feet)	Depth (feet below land surface)
N4150		
Fill.	3	0 - 3
Bog.	9	3 - 12
Pleistocene Deposits:		
Sand, coarse, brown, grit and gravel.	10	12 - 22
Sand, coarse, gray, grit, gravel, and lumps of clay.	14	22 - 36
Sand, very fine to fine, silty, gray-green; layers of gray-green silt and solid clay ("20 foot" clay).	15	36 - 51
Magothy (?) Formation:		
Sand, fine to coarse, gray layers of lignite; some thin layers of gray solid clay.	21	51 - 72
Sand, fine to medium, gray.	7	72 - 79
Sand, medium to coarse, gray, some thin layers of gray solid clay, and lignite.	31	79 - 110
Clay, solid, gray; layers of lignite and gray medium to coarse clayey sand.	6	110 - 116
Sand, medium to coarse, gray.	20	116 - 136
Sand, fine, clayey, gray; thin layers of lignite and gray medium sand.	15	136 - 151
Sand, fine to medium, gray; some clay.	18	151 - 169
Sand, medium to coarse, gray; layers of lignite.	8	169 - 177
Sand, fine to medium, gray; some clay; layers of lignite.	18	177 - 195
Clay, solid, gray; thin layers of gray, fine to medium sand and lignite.	13	195 - 208
Sand, fine to medium, gray; thin layers of gray clayey sand and lignite.	20	208 - 228
Sand, fine to medium, gray; layers of gray sandy and solid clay.	16	228 - 244

GEOLOGIC LOGS

Description	Thickness (feet)	Depth (feet below land surface)
N4150 (cont'd.)		
Clay, solid, gray, some thin layers of clayey fine sand.	8	244 - 252
Sand, fine to medium, gray; some thin layers of gray solid clay and lignite.	13	252 - 265
Sand, fine to medium, gray; trace of clay.	20	265 - 285
Sand, fine to medium, gray; layers of clayey sand and lignite.	31	285 - 316
Clay, silty and sandy, laminated, gray.	18	316 - 334
Sand, fine to medium, gray; trace of clay and lignite layers.	31	334 - 365
Sand, fine, clayey, gray; layers of gray sandy clay.	11	365 - 376
Sand, fine to medium, gray; layers of gray clayey sand, lignite, and pyrite.	7	376 - 383
Clay, silty and sandy, gray; some thin layers of gray fine to medium clayey sand and lignite.	20	383 - 403
Sand, fine to medium, gray; some layers of clay and lignite.	15	403 - 418
Sand, fine to medium, gray.	12	418 - 430
Sand, fine, gray; some clay.	16	430 - 446
Clay, solid, gray; layers of gray sandy silt.	9	446 - 455
Sand, fine to medium, gray; some layers of clay and lignite.	15	455 - 470
Sand, fine to medium, gray; some thin layers of clayey sand.	22	470 - 492
Sand, fine, clayey, gray.	14	492 - 506
Sand, fine to medium, gray; thin lignite layers.	16	506 - 522
Sand, fine to medium, gray; some clay.	12	522 - 534
Sand, very fine to fine, gray; some clay and silt.	34	534 - 568

GEOLOGIC LOGS

Description	Thickness (feet)	Depth (feet below land surface
N4150 (cont'd.)		
Clay, solid, gray; some thin silt and lignite layers.	12	568 - 580
Clay, sandy and silty, gray; and layers of fine to medium clayey sand.	18	580 - 598
Sand, fine to medium, gray; trace of clay.	10	598 - 608
Clay, solid, gray; some thin layers of gray clayey medium sand.	23	608 - 631
Sand, medium to very coarse, gray.	8	631 - 639
Sand, fine to medium, gray; some thin layers of clay and lignite.	14	639 - 653
Sand, fine to coarse, gray; layers of lignite.	8	653 - 661
Sand, coarse to very coarse, gray; some thin layers of clayey coarse sand.	6	661 - 667
Clay, solid and silty, gray, laminated.	14	667 - 681
Sand, coarse to very coarse, gray; gravel; some layers of solid clay.	22	681 - 703
Sand, medium to coarse, gray.	22	703 - 725
Sand, medium to very coarse, gray; gravel; trace of clay; thin layers of gray solid clay.	27	725 - 752
…ritan Formation:		
Clay, solid, gray.	13	752 - 765
Sand, fine, clayey, gray.	17	765 - 782
Sand, fine to medium, gray; some clay.	11	782 - 793
Clay, solid, light and dark gray and salmon red; some thin layers of silt.	33	793 - 826
…365		
…ent and Upper Pleistocene Deposits:		
Fill and bog.	20	0 - 20

GEOLOGIC LOGS

Description	Thickness (feet)	Depth (feet below land surface)
N3865 (cont'd.)		
Upper Pleistocene Deposits:		
Sand, coarse, brown	13	20 - 33
Clay, gray ("20 foot" clay).	17	33 - 50
Sand, medium, brown.	10	50 - 60
Magothy (?) Formation:		
Clay, solid and silty, gray; thin layers of lignite	25	60 - 85
Sand, fine to coarse, gray; some layers of clayey-sand, gray solid clay; lignite.	45	85 - 130
Clay, sandy, gray; layers of solid clay, medium-gray sand; lignite.	46	130 - 176
Sand, fine to medium, gray; trace of gray clay; lignite.	15	176 - 191
Clay, solid and sandy, gray; some layers of fine to medium gray sand.	35	191 - 226
Sand, medium, gray; some fine sand and clay.	19	226 - 245
Clay, sandy and silty, gray; some layers of lignite and gray clayey sand.	24	245 - 269
Sand, medium, clayey, gray.	27	269 - 296
Clay, solid, gray; thin layers of fine sand and silt.	12	296 - 308
Sand, fine to medium, clayey, gray; layers of sandy clay and lignite.	26	308 - 334
Clay, solid, dark-gray, and lignite.	15	334 - 349
Sand, medium, gray; layers of gray sandy clay, fine sand and lignite.	59	349 - 408
Sand, fine to medium, clayey gray; thin layers of solid gray clay.	34	408 - 442

GEOLOGIC LOGS

Description	Thickness (feet)	Depth (feet below land surface)
N3865(cont'd.)		
Sand, fine, clayey, gray; some layers of medium gray sand, solid clay, and lignite.	68	442 - 510
Sand, fine to medium, clayey, gray; thin layers of lignite.	32	510 - 542
Sand, medium to coarse, gray; some layers of fine clayey sand.	32	542 - 574
Clay, solid, gray.	17	574 - 591
Sand, very fine to fine gray; some layers of solid gray clay and fine to medium clayey sand.	23	591 - 614
Sand, medium to very coarse, gray; trace of gray clay.	24	614 - 638
Clay, solid, gray.	8	638 - 646
Sand, fine to medium, clayey, gray; some layers of coarse to very coarse sand, gravel; and lignite.	21	646 - 667
Clay, solid, light gray.	12	667 - 679
Sand, fine, clayey, gray; layers of medium to very coarse sand, gravel, and lignite.	33	679 - 712
Sand, fine to medium, clayey, gray.	36	712 - 748
Raritan Formation:		
Clay member:		
Clay, solid and silty, gray; some layers of sandy clay.	12	748 - 760
Sand, fine to medium, clayey, gray; layers of sandy clay and lignite.	26	760 - 786
Clay, solid and silty, light-brown and gray; layers of sandy clay and lignite.	63	786 - 849

GEOLOGIC LOGS

Description	Thickness (feet)	Depth (feet below land surface)
N8831		
Recent Deposits:		
Sand.	8	0 - 8
Clay, some meadow bog.	7	8 - 15
Upper Pleistocene Deposits:		
Sand, fine.	25	15 - 40
Sand and Gravel.	15	40 - 55
Clay, gray; ("20 foot" clay)	26	55 - 81
Magothy (?) Formation:		
Sand, fine.	21	81 - 102
N8763		
Recent Deposits:		
Fill.	8	0 - 8
Meadow Bog.	12	8 - 20
Upper Pleistocene Deposits:		
Sand and Gravel.	48	20 - 68
Clay, gray; ("20 foot" clay)	20	68 - 88
Pleistocene Deposits		
Clay, blue (Gardiners Clay?)	34	88 - 122
Magothy (?) Formation:		
Sand and Gravel	8	122 - 130

Geraghty & Miller, Inc.

GEOLOGIC LOGS

Description	Thickness (feet)	Depth (feet below land surface)
N8849		
Recent Deposits:		
Fill.	12	0 - 12
Meadow Bog.	8	12 - 20
Upper Pleistocene Deposits:		
Sand, coarse.	10	20 - 30
Sand, coarse; some stones.	12	30 - 42
Sand, fine; some stones.	17	42 - 59
Clay ("20 foot" clay).	12	59 - 71
Clay; some sand ("20 foot" clay)	14	71 - 85
Magothy (?) Formation:		
Sand, fine.	14	85 - 95
N8806		
Recent Deposits:		
Sand and gravel.	8	0 - 8
Meadow Bog.	11	8 - 19
Upper Pleistocene Deposits:		
Sand and gravel.	27	19 - 46
Clay, gray; ("20 foot" clay)	56	46 - 102
Magothy (?) Formation:		
Sand, coarse	31	102 - 133
Sand, fine.	15	133 - 148
Clay, white	3	148 - 151
Sand, fine.	12	151 - 163
Sand, fine; some wood.	10	163 - 173

GEOLOGIC LOGS

…scription	Thickness (feet)	Depth (feet below land surface)
…806 (cont'd.)		
Sand, fine, some clay.	11	173 - 184
Sand, fine.	31	184 - 215
Sand; some clay, wood.	10	215 - 225
…770		
…per Pleistocene Deposits:		
Sand, fine.	10	0 - 10
Sand and gravel.	51	10 - 61
Clay, gray; ("20 foot" clay).	12	61 - 73
…gothy (?) Formation:		
Gravel.	10	73 - 83
Sand and gravel.	4	83 - 87
Sand, fine.	39	87 - 126
Sand, coarse.	20	126 - 146

REFERENCE NO. 25

ENGINEERING INVESTIGATIONS AT
INACTIVE HAZARDOUS WASTE SITES
IN THE STATE OF NEW YORK

PHASE I INVESTIGATIONS

MERRICK LANDFILL
TOWN OF HEMPSTEAD
NASSAU COUNTY, NEW YORK
NYSDEC SITE NO. 130022

Prepared for

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
50 Wolf Road, Albany, New York 12233

Henry G. Williams, Commissioner

Division of Solid and Hazardous Waste

Norman H. Nosenchuck, P.E.
Director

Prepared by

WOODWARD-CLYDE CONSULTANTS, INC.
1250 Broadway, 15th Floor
New York, New York 10001

December 1985
82C4548-3

1

ENGINEERING INVESTIGATIONS AT INACTIVE HAZARDOUS WASTE SITES IN THE STATE OF NEW YORK

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MERRICK LANDFILL
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NASSAU COUNTY, NEW YORK
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1	SITE LOCATION MAP
2	LOCATION PLAN FOR PROPOSED PHASE II INVESTIGATION

APPENDICES

APPENDIX	TITLE
A	REFERENCES
B	SUPPORTING DOCUMENTATION
C	UPDATED NEW YORK STATE REGISTRY FORM

The Merrick Landfill is located in the town of Hempstead, Nassau County, New York (Figure 1). The Merrick Landfill is located in a generally residential and commercial area. The facility operated at the 1600 Merrick Road site from 1950 until 1984. Before this time the site was reportedly used by local residents as an open dump.

The site is an inactive municipal landfill, closed in 1984. There have been no reported hazardous dumping incidents. Leachate has been observed at the site and headspace analysis revealed methane and ammonia. Ground water is the major route of concern. Surface water is of lesser concern. Municipal, State and Federal Agencies have conducted a preliminary screening of air quality. Heavy metals have been discharged into Merrick Bay (Juczak and Schafer, 1985).

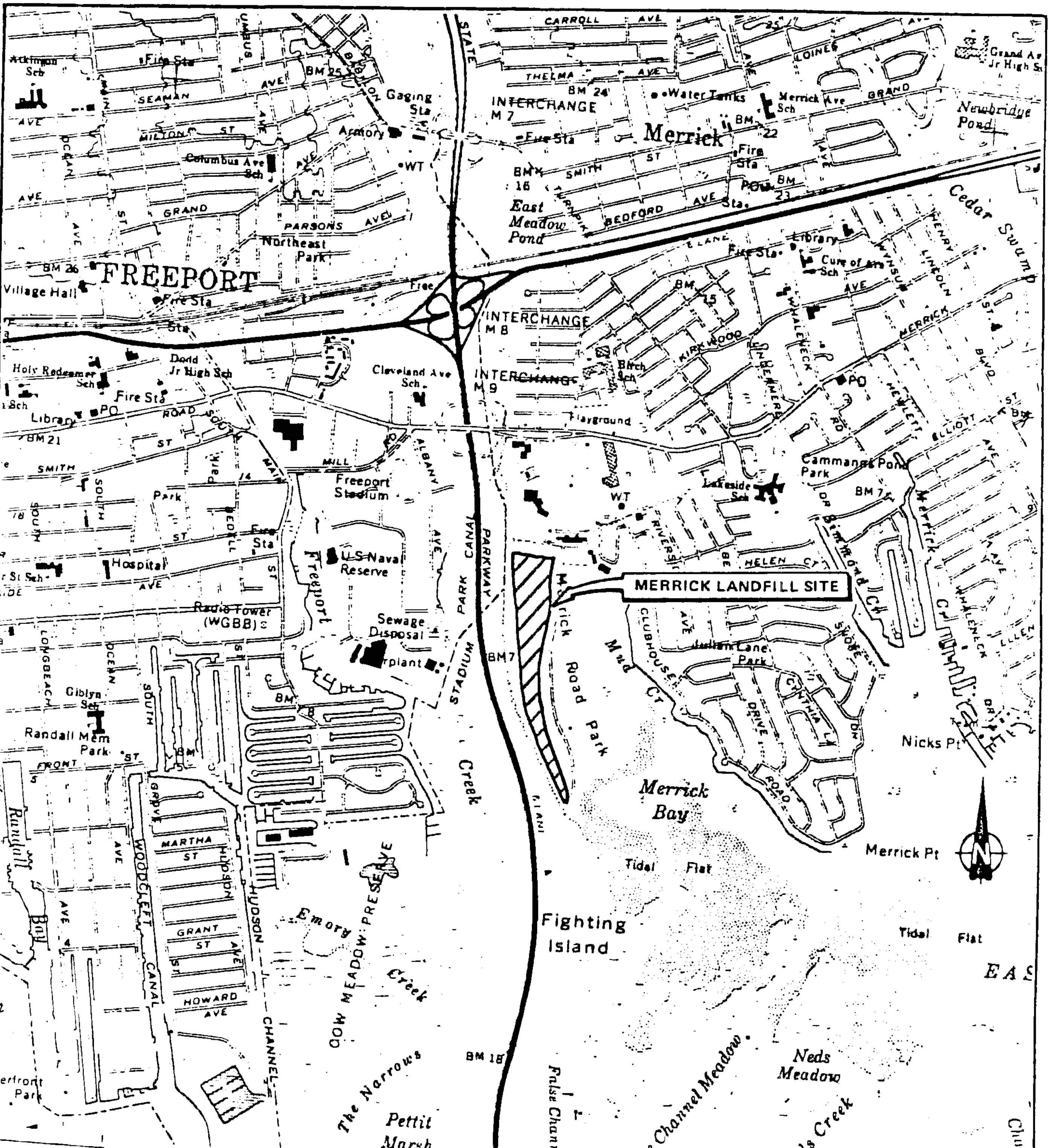
The Phase I effort for the Merrick Landfill included: collection and review of existing data; preparation of a preliminary Hazard Ranking Score (HRS) for the site; conducting a site investigation/responsible parties interview; development of a preliminary hydrogeologic model; completion of required documentation; development of a work plan and estimated costs for further investigations at the site; and preparation of a summary report.

The preliminary HRS scores developed for the Merrick Landfill (NYSDEC Site No. 130022) are as follows:

S_M = 22.62 (Sgw = 36.19 Ssw = 14.88 Sa = 0)
S_{FE} = N/A
SDC = 0

Available data were generally adequate for all items except for waste characteristics, for which there are few data on toxicity, persistence or hazardous waste quantity.

The Phase II Work Plan developed for the Merrick Landfill is specifically designed to address questions concerning soil, ground water and air quality so that a final HRS score and conceptual remedial designs and estimated costs can be developed. We have proposed a limited geophysical survey, the installation of six monitoring wells, ground water, surface water, leachate, stream sediments and soil sampling and air monitoring. A detailed description of the work plan and estimated costs is provided in Section 6.0.



0 2000 4000 FT

SCALE

COORDINATES

LAT. 40° 39' 08"

LONG. 73° 33' 47"

MAP SOURCE:

USGS MAP FREEPORT QUADRANGLE

NEW YORK–NASSAU CO.

7.5 MINUTE SERIES 1979

DEPARTMENT OF ENVIRONMENTAL CONSERVATION · NEW YORK STATE

Prepared for
NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
50 Wolf Road, Albany, New York 12233
Henry G. Williams, Commissioner

Division of Solid and Hazardous Waste
Norman H. Nosenchuck, P.E.
Director

Approved

MERRICK LANDFILL SITE
PHASE I INVESTIGATION
SITE LOCATION MAP

Prepared by
WOODWARD—CLYDE CONSULTANTS, INC.
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
NEW YORK, NEW YORK

DR BY:	DTW	SCALE	AS SHOWN	PROJ NO	82C4548-3
CK'D BY:	DM	DATE	22 JAN 1985	FIG NO	1

1.0

NARRATIVE SUMMARY

The Merrick Landfill site covers 82 acres and is located in Merrick, Nassau County, New York. The landfill has been operated by the Town of Hempstead Department of Sanitation since 1950. Before this time the site was reportedly used by local residents as an open dump. Site facilities include an inactive incinerator and rehabilitation lagoons. The landfill was closed in 1984 when it reached its capacity. Under a Consent Order from the State of New York, the Town of Hempstead was directed to prepare a capping-closure plan including proposed monitoring of ground water and the surface water surrounding the site.

The site is situated in a generally residential/commerical area of Long Island. The landfill itself is separated from residences by the Merrick Road Park Golf Club and Mud Creek on the east, the incinerator and administrative buildings on the north and the Meadowbrook State Parkway on the west.

There is no known history of observed or alleged hazardous waste dumping in the landfill. During the site visit, however, leachate was observed discharging from the slopes. Headspace analysis of leachate has shown concentrations of ammonia, although most of the vapors are probably methane. Before the lagoons were rehabilitated, the outfalls discharging into East Bay included, among other things, elevated levels of heavy metals.

Any discharge from the landfill into the surrounding waters would be diluted by the Bay waters and would be mixed with discharges from other sources of pollution in the area. Similarly, air contaminants would dispense downwind off the site. Methanol has been detected in ambient air samples 1000 feet downwind

Total population served by ground water within a 3-mile radius of the site exceeds 260,000.

2.0

U.S. ENVIRONMENTAL PROTECTION AGENCY DOCUMENTATION

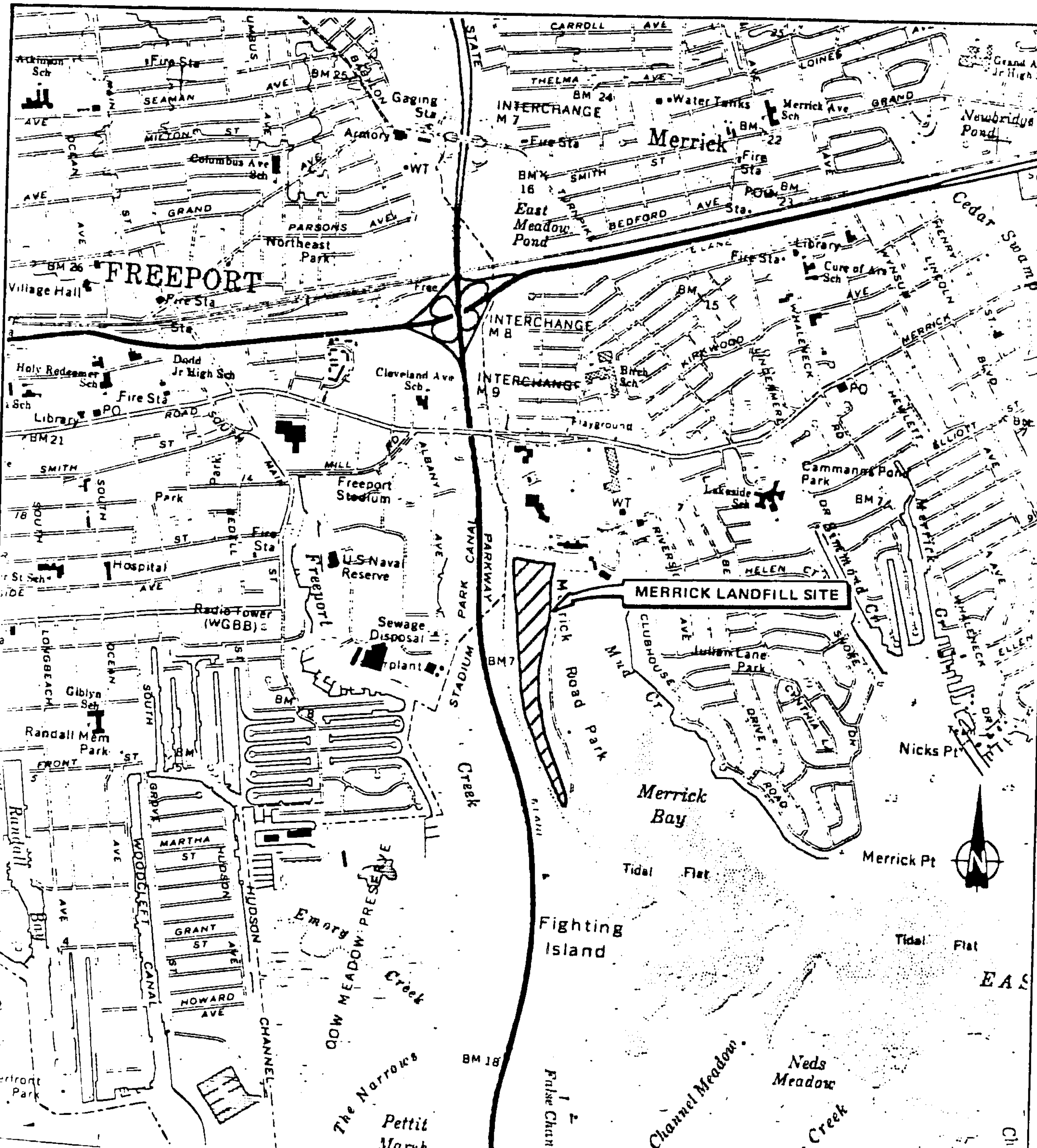
This section includes documentation records and work sheets required to develop Hazard Ranking System (HRS) scores. In addition, two EPA forms regarding site inspection and preliminary assessment have been completed and are included as required.

Documents included in this section are:

1. Preliminary Hazard Ranking System (HRS) Work Sheets
2. Documentation Records for HRS
3. EPA Form 2070-12 (Preliminary Assessment)
4. EPA Form 2070-13 (Site Inspection Report)

All forms were prepared as completely as possible using information available from county, state and federal agency files. Values assigned to the HRS rating factors are indicated with a circle or a square for complete or incomplete data, respectively. A square can also reflect ambiguous instructions for a particular rating factor.

All information provided in the Documentation Records for HRS is referenced, and copies of pertinent information are included ih Appendix B. In addition, all analytical results are included in the appendix. Agencies contacted for information on the site are included in Table 1.



0 2000 4000 FT

SCALE

COORDINATES

LAT. 40° 39' 08"

LONG. 73° 33' 47"

MAP SOURCE:

USGS MAP FREEPORT QUADRANGLE
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DEPARTMENT OF ENVIRONMENTAL CONSERVATION NEW YORK STATE

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Approved

MERRICK LANDFILL SITE
PHASE I INVESTIGATION
SITE LOCATION MAP

Prepared by
WOODWARD—CLYDE CONSULTANTS, INC.
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
NEW YORK, NEW YORK

DR BY	DTW	SCALE	AS SHOWN	PROJ NO	82C4548-3
CK'D BY	DM	DATE	22 JAN 1985	FIG NO	1

11

2.1 Preliminary Hazard Ranking System (HRS) Work Sheets

Facility name: Merrick Landfill

Location: Merrick, New York

EPA Region: II

Person(s) in charge of the facility: James Heil, Commissioner of Sanitation

Name of Reviewer: Michael Akerbergs   Date: February 28, 1985

General description of the facility:

(For example: landfill, surface impoundment, pile, container; types of hazardous substances; location of the facility; contamination route of major concern; types of information needed for rating; agency action, etc.)

The site is an inactive municipal landfill, closed in 1984. There have been no reported hazardous dumping incidents. Leachate has been observed at the site and contains methane and ammonia. Ground water is the major route of concern. Surface water is a less concern. Municipal, State and Federal agencies have conducted a preliminary screening of air quality. Heavy metals have been discharged into Merrick Bay.

Scores: S_M = 22.62 (S_{gw} = 36.19 S_{sw} = 14.88 S_a = 0)

S_{FE} = N/A

S_{DC} = 0

FIGURE 1
HRS COVER SHEET

13

Ground Water Route Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Observed Release	0 45	1		45	3.1
If observed release is given a score of 45, proceed to line 4. If observed release is given a score of 0, proceed to line 2.					
2 Route Characteristics					3.2
Depth to Aquifer of Concern	0 1 2 3	2	6	6	
Net Precipitation	0 1 2 3	1	2	3	
Permeability of the Unsaturated Zone	0 1 2 3	1	3	3	
Physical State	0 1 2 3	1	3	3	
	Total Route Characteristics Score		14	15	
3 Containment	0 1 2 3	1	3	3	3.3
4 Waste Characteristics					3.4
Toxicity/Persistence	0 3 6 9 12 15 18	1	18	18	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1	1	8	
	Total Waste Characteristics Score		19	26	
5 Targets					3.5
Ground Water Use	0 1 2 3	3	6	9	
Distance to Nearest Well/Population Served	0 4 6 8 10 / 12 16 18 20 / 24 30 32 35 40	1	20	40	
	Total Targets Score		26	49	
6 If line 1 is 45, multiply 1 x 4 x 5 / If line 1 is 0, multiply 2 x 3 x 4 x 5			20748	57,330	
7 Divide line 6 by 57,330 and multiply by 100			S_{gw} = 36.19		

FIGURE 2
GROUND WATER ROUTE WORK SHEET

Surface Water Route Work Sheet					
Rating Factor	**Assigned Value (Circle One)**	**Multi-plier**	**Score**	**Max. Score**	**Ref. (Section)**
1 Observed Release	0 45	1	0	45	4.1
If observed release is given a value of 45, proceed to line 4. If observed release is given a value of 0, proceed to line 2.					
2 Route Characteristics					4.2
Facility Slope and Intervening Terrain	0 1 2 3	1	3	3	
1-yr. 24-hr. Rainfall	0 1 2 3	1	2	3	
Distance to Nearest Surface Water	0 1 2 3	2	6	6	
Physical State	0 1 2 3	1	3	3	
	Total Route Characteristics Score		14	15	
3 Containment	0 1 2 3	1	3	3	4.3
4 Waste Characteristics					4.4
Toxicity/Persistence	0 3 6 9 12 15 18	1	18	18	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1	1	8	
	Total Waste Characteristics Score		19	26	
5 Targets					4.5
Surface Water Use	0 1 2 3	3	6	9	
Distance to a Sensitive Environment	0 1 2 3	2	6	6	
Population Served/Distance to Water Intake Downstream	0 4 6 8 10 12 16 18 20 24 30 32 35 40	1	0	40	
	Total Targets Score		12	55	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			9576	64,350	
7 Divide line 6 by 64,350 and multiply by 100		S_{sw} = 14.88			

FIGURE 7
SURFACE WATER ROUTE WORK SHEET

Air Route Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Observed Release	0 45	1		45	5.1
Date and Location:					
Sampling Protocol:					
If line 1 is 0, the S_a = 0. Enter on line 5. If line 1 is 45, then proceed to line 2.					
2 Waste Characteristics					5.2
Reactivity and Incompatibility	0 1 2 3	1		3	
Toxicity	0 1 2 3	3		9	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8	
	Total Waste Characteristics Score			20	
3 Targets					5.3
Population Within 4-Mile Radius	0 9 12 15 18 21 24 27 30	1		30	
Distance to Sensitive Environment	0 1 2 3	2		6	
Land Use	0 1 2 3	1		3	
	Total Targets Score			39	
4 Multiply 1 x 2 x 3				35,100	
5 Divide line 4 by 35,100 and multiply by 100	S_a = 0				

FIGURE 9
AIR ROUTE WORK SHEET

	S	S^2
Groundwater Route Score (S_{gw})	36.19	1309.72
Surface Water Route Score (S_{sw})	14.88	221.41
Air Route Score (S_a)	0	0
$S_{gw}^2 + S_{sw}^2 + S_a^2$		1531.13
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		39.13
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} / 1.73 = S_M =$		22.62

FIGURE 10
WORKSHEET FOR COMPUTING S_M

Fire and Explosion Work Sheet N/A					
Rating Factor	**Assigned Value (Circle One)**	**Multi-plier**	**Score**	**Max. Score**	**Ref. (Section)**
1 Containment	1 3	1		3	7.1
2 Waste Characteristics					7.2
Direct Evidence	0 3	1		3	
Ignitability	0 1 2 3	1		3	
Reactivity	0 1 2 3	1		3	
Incompatibility	0 1 2 3	1		3	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8	
Total Waste Characteristics Score				20	
3 Targets					7.3
Distance to Nearest Population	0 1 2 3 4 5	1		5	
Distance to Nearest Building	0 1 2 3	1		3	
Distance to Sensitive Environment	0 1 2 3	1		3	
Land Use	0 1 2 3	1		3	
Population Within 2-Mile Radius	0 1 2 3 4 5	1		5	
Buildings Within 2-Mile Radius	0 1 2 3 4 5	1		5	
Total Targets Score				24	
4 Multiply 1 x 2 x 3				1,440	
5 Divide line 4 by 1,440 and multiply by 100	S_{FE} =				

FIGURE 11
FIRE AND EXPLOSION WORK SHEET

Direct Contact Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1 Observed Incident	0 45	1	0	45	8.1
If line 1 is 45, proceed to line 4 If line 1 is 0, proceed to line 2					
2 Accessibility	0 1 2 3	1	0	3	8.2
3 Containment	0 15	1	0	15	8.3
4 Waste Characteristics Toxicity	0 1 2 3	5	15	15	8.4
5 Targets					8.5
Population Within a 1-Mile Radius	0 1 2 3 4 5	4	20	20	
Distance to a Critical Habitat	0 1 2 3	4	0	12	
	Total Targets Score		20	32	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5				21,600	
7 Divide line 6 by 21,600 and multiply by 100	S_{DC} = 0				

FIGURE 12
DIRECT CONTACT WORK SHEET

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2.2 Documentation Records for HRS

DOCUMENTATION RECORDS
FOR HAZARD RANKING SYSTEM

INSTRUCTIONS: The purpose of these records is to provide a convenient way to prepare an auditable record of the data and documentation used to apply the Hazard Ranking System to a given facility. As briefly as possible summarize the information you used to assign the score for each factor (e.g., "Waste quantity = 4,230 drums plus 800 cubic yards of sludges"). The source of information should be provided for each entry and should be a bibliographic-type reference that will make the document used for a given data point easier to find. Include the location of the document and consider appending a copy of the relevant page(s) for ease in review.

FACILITY NAME: Merrick Landfill

LOCATION: 1600 Merrick Road, Merrick, New York

DATE SCORED: February 28, 1985

PERSON SCORING: Michael Akerbergs

PRIMARY SOURCE(S) OF INFORMATION (e.g., EPA region, state, FIT, etc.):

Nassau County Department of Health Files.
NYSDEC Region I Files.

FACTORS NOT SCORED DUE TO INSUFFICIENT INFORMATION:

See section 5.0 - Data Adequacy

COMMENTS OR QUALIFICATIONS:

GROUND WATER ROUTE

1. OBSERVED RELEASE

Contaminants detected (5 maximum):

None

Rationale for attributing the contaminants to the facility:

Not applicable.

* * *

2. ROUTE CHARACTERISTICS

<u>Depth to Aquifer of Concern</u>

Name/description of aquifer(s) of concern:

Upper Glacial Aquifer, (Franke and McClymonds, 1982).
Separated from Magothy, formation below by "20 foot clay"
(Geraughty and Miller, 1981).

Depth(s) from the ground surface to the highest seasonal level of the saturated zone (water table(s)) of the aquifer of concern:

Less than 20 feet to upper glacial aquifer (Geraghty and Miller, 1981, Table 1).

Depth from the ground surface to the lowest point of waste disposal/storage:

0 feet (Woodward-Clyde Consultants, Inc. (WCCI) Site Survey, 1985).

<u>Net Precipitation</u>

Mean annual or seasonal precipitation (list months for seasonal):

44 inches (User's Manual).

Mean annual lake or seasonal evaporation (list months for seasonal):

31 inches (User's Manual).

Net precipitation (subtract the above figures):

13 inches.

<u>Permeability of Unsaturated Zone</u>

Soil type in unsaturated zone:

Sand and gravel (WCCI, 1985).

Permeability associated with soil type:

Greater than 10^{-3} cm/sec (User's Manual).

<u>Physical State</u>

Physical state of substances at time of disposal (or at present time for generated gases):

Solid and liquid (WCCI, 1985).

3. CONTAINMENT

<u>Containment</u>

Method(s) of waste or leachate containment evaluated:

No containment (WCCI, 1985).

Method with highest score:

Landfill - no liner -3 (User's Manual).

4. WASTE CHARACTERISTICS

<u>Toxicity and Persistence</u>

Compound(s) evaluated:

	Toxicity	Persistence
Zinc	3	3
Ammonia	2	1

(USEPA, 1984; Juszak, Schafer, 1975)

Compound with highest score:

Zinc - 18 (User's Manual).

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum):

No data on quantity - use lowest category less than 10 cubic yards.

Basis of estimating and/or computing waste quantity:

Presence of leachate, old outfall from lagoons (USEPA, 1984).

5. TARGETS

Ground Water Use

Use(s) of aquifer(s) of concern within a 3-mile radius of the facility:

Wells exist in Magothy but are effectively isolated hydraulically from aquifers above by confining clay-score is 0. Upper Glacial Aquifer also has public supply wells: (Kilburn, 1982). These wells are standby while Magothy wells are now used.

Distance to Nearest Well

Location of nearest well drawing from aquifer of concern or occupied building not served by a public water supply:

Two well fields for Long Island Water Co. about 2.5 miles to northwest (Kilburn, 1982). N.Y. Water Service wells NNE of site (#3187,2577 etc.) are in Upper Glacial aquifer but are either destroyed or on standby (Conover,1986;Kilburn,1982)

Distance to above well or building:

About 2.5 miles (Kilburn, 1982).

Population Served by Ground Water Wells Within a 3-Mile Radius

Identified water-supply well(s) drawing from aquifer(s) of concern within a 3-mile radius and populations served by each:

Water supply wells for Long Island Water Co. (NY State Department of Health, 1982).

Computation of land area irrigated by supply well(s) drawing from aquifer(s) of concern within a 3-mile radius, and conversion to population (1.5 people per acre):

Unknown number of irrigation wells (public schools and parks), no crops (Kilburn, 1982).

Total population served by ground water within a 3-mile radius:

At least 260,000
Water Supply wells in Upper Glacial aquifer for Long Island Water Co. (NY State Department of Health, 1982).

SURFACE WATER ROUTE

1. OBSERVED RELEASE

Contaminants detected in surface water at the facility or downhill from it (5 maximum):

None.

Rationale for attributing the contaminants to the facility:

N/A

2. ROUTE CHARACTERISTICS

<u>Facility Slope and Intervening Terrain</u>

Average slope of facility in percent:

Greater than 8% slopes
Less than 3% top
(USGS, 1979)

Name/description of nearest downslope surface water:

Merrick Bay
(USGS, 1969)

Average slope of terrain between facility and above-cited surface water body in percent:

Greater than 8% (WCCI, 1985)

Is the facility located either totally or partially in surface water?

Yes (WCCI, 1985)

Is the facility completely surrounded by areas of higher elevation?

No (WCCI, 1985)
(USGS, 1979)

1-Year 24-Hour Rainfall in Inches

2.7 inches (User's Manual)

Distance to Nearest Downslope Surface Water

0 feet (WCCI, 1985)

Physical State of Waste

Solid and liquid (WCCI, 1985)

* * *

3. CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

Scored as Landfill -3 (User's Manual, WCCI, 1985).

Method with highest score:

Landfill -3.

4. WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated

See ground water.

Compound with highest score:

See ground water.

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum):

See ground water.

Basis of estimating and/or computing waste quantity:

See ground water.

* * *

5. TARGETS

<u>Surface Water Use</u>

Use(s) of surface water within 3 miles downstream of the hazardous substance:

Recreation, fishing and clam harvestsing (WCCI, 1985).

Is there tidal influence?

Yes (USGS, 1979).

<u>Distance to a Sensitive Environment</u>

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

100 feet (WCCI, 1985).

Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:

200 feet to north NY State Wetland ID# F-16 (NYSDEC, Region 1, 1984).

Distance to critical habitat of an endangered species or national wildlife refuge, if 1 mile or less:

None (NYSDEC, 1984b).

<u>Population Served by Surface Water</u>

Location(s) of water-supply intake(s) within 3 miles (free-flowing bodies) or 1 mile (static water bodies) downstream of the hazardous substance and population served by each intake:

None

Computation of land area irrigated by above-cited intake(s) and conversion to population (1.5 people per acre):

None

Total population served:

N/A

Name/description of nearest of above water bodies:

N/A

Distance to above-cited intakes, measured in stream miles:

N/A

AIR ROUTE

1. OBSERVED RELEASE

Contaminants detected:

Methanol detected in preliminary screening off-site (WCCI, 1986).
Not considered hazardous under CERLA. Not an observed release.

Date and location of detection of contaminants:

Sampling with TAGA 6000.
100 feet north of landfill (USEPA, 1984).
Sampling with OVA on landfill (WCCI, 1986).

Methods used to detect the contaminants:

TAGA 6000
OVA in surveymode
Victoreen Thyac II
(USEPA, 1984)

Rationale for attributing the contaminants to the site:

Sample taken 1000 feet north of landfill (USEPA, 1984) downwind..

* * *

2. WASTE CHARACTERISTICS

Reactivity and Incompatibility

Most reactive compound:

N/A

Most incompatible pair of compounds:

N/A

Toxicity

Most toxic compound:

Methanol -I (NFPA, 1975).

Hazardous Waste Quantity

Total quantity of hazardous waste:

See ground water.

Basis of estimating and/or computing waste quantity:

See ground water.

* * *

3. TARGETS

Population Within 4-Mile Radius

Circle radius used, give population, and indicate how determined:

0 to 4 mi	0 to 1 mi	0 to 1/2 mi	0 to 1/4 mi
89,187	10,015	2,066	0

(Donnelly Marketing, 1984)

Distance to a Sensitive Environment

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

See ground water.

Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:

See ground water.

Distance to critical habitat of an endangered species, if 1 mile or less:

See ground water.

Land Use

Distance to commercial/industrial area, if 1 mile or less:

3,600 feet (WCCI, 1985).

Distance to national or state park, forest, or wildlife reserve, if 2 miles or less:

None

Distance to residential area, if 2 miles or less:

1,800 feet (WCCI, 1985).

Distance to agricultural land in production within past 5 years, if 1 mile or less:

None (NYS Department of Agricuture and Markets, 1984).

Distance to prime agricultural land in production within past 5 years, if 2 miles or less:

None (NYS Department of Agriculture and Markets, 1984).

Is a historic or landmark site (National Register of Historical Places and National Natural Landmarks) within the view of the site?

No (NYS Parks and Recreation, 1984).

FIRE AND EXPLOSION

1. CONTAINMENT

Hazardous substances present:

Methane
Ammonia
(USEPA, 1984)

Type of containment, if applicable:

N/A

* * *

2. WASTE CHARACTERISTICS

Direct Evidence

Type of instrument and measurements:

See air route.

Ignitability

Compound used:

Methane-3
(User's Manual)

Reactivity

Most reactive compound:

None - all score 0 (User's Manual).

Incompatibility

Most incompatible pair of compounds:

None (User's Manual Table 12).

* * *

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility:

See ground water.

Basis of estimating and/or computing waste quantity:

See ground water.

* * *

3. TARGETS

Distance to Nearest Population

1,800 feet (WCCI, 1985).

Distance to Nearest Building

250 feet transfer station (WCCI, 1985).

Distance to Sensitive Environment

Distance to wetlands:

See surface water.

Distance to critical habitat:

See surface water.

Land Use

Distance to commerical/industrial area, if 1 mile or less:

See surface water.

Distance to national or state park, forest, or wildlife reserve, if 2 miles or less:

See surface water.

Distance to residential area, if 2 miles or less:

See surface water.

Distance to agricultural land in production within past 5 years, if 1 mile or less:

See surface water.

Distance to prime agricultural land in production within past 5 years, if 2 miles or less:

See surface water.

Is a historic or landmark site (National Register or Historic Places and National Natural Landmarks) within the view of the site?

See surface water.

Population Within 2-Mile Radius

28,890 (Donnelly Marketing, 1984)

Buildings Within 2- Mile Radius

8,624 (Donnelly Marketing, 1984)

DIRECT CONTACT

1. OBSERVED INCIDENT

Date, location, and pertinent details of incident:

None

* * *

2. ACCESSIBILITY

Describe type of barrier(s):

Complete barrier 2/3 of site surrounded by water - 24 hr. surveillance - security guard - controlled entry - signs posted (WCCI, 1985).

* * *

3. CONTAINMENT

Type of containment, if applicable:

N/A

* * *

4. WASTE CHARACTERISTICS

Toxicity

Compounds evaluated:

See ground water.

Compound with highest score:

See ground water.

* * *

5. TARGETS

Population within one-mile radius

10,015 (Donnelly Marketing, 1984)

Distance to critical habitat (of endangered species)

See surface water.

2.3 EPA Form 2070-12 (Preliminary Assessment)

EPA

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION

01 STATE: NY | 02 SITE NUMBER: 0091

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site): Merrick Landfill

02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER: 1600 Merrick Road

03 CITY: Merrick | 04 STATE: NY | 05 ZIP CODE: 11566 | 06 COUNTY: Nassau | 07 COUNTY CODE: | 08 CONG DIST:

09 COORDINATES LATITUDE: 40 39 08. LONGITUDE: 073 33 47.

10 DIRECTIONS TO SITE (Starting from nearest public road): Site is at Meadowbrook Parkway, Merrick Road intersection.

III. RESPONSIBLE PARTIES

01 OWNER (If known): Town of Hempstead

02 STREET (Business, mailing, residential): Town Hall Plaza Main St.

03 CITY: Hempstead | 04 STATE: NY | 05 ZIP CODE: 11550 | 06 TELEPHONE NUMBER: (516) 378-4210

07 OPERATOR (If known and different from owner): Same

08 STREET (Business, mailing, residential):

09 CITY: | 10 STATE: | 11 ZIP CODE: | 12 TELEPHONE NUMBER: ( )

13 TYPE OF OWNERSHIP (Check one)
☐ A. PRIVATE ☐ B. FEDERAL: ______ (Agency name) ☐ C. STATE ☐ D. COUNTY ■ E. MUNICIPAL
☐ F. OTHER: ______ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)
☐ A. RCRA 3001 DATE RECEIVED: / / (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: / / (MONTH DAY YEAR) ■ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION
■ YES DATE 1 / 3 / 85 (MONTH DAY YEAR)
☐ NO

BY (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR ☐ C. STATE ■ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☐ F. OTHER: ______ (Specify)

CONTRACTOR NAME(S): Woodward-Clyde Consultants, Inc

02 SITE STATUS (Check one)
☐ A. ACTIVE ■ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION: 1950 (BEGINNING YEAR) | 1984 (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED

Site is municipal waste dump. No known hazardous waste substances have been dumped. Leachate contains methane above background levels.

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

No data exists on environmental effects or potential for such effects. Closure Plan contains environmental monitoring plan.

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)

☐ A. HIGH (Inspection required promptly) ■ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT: Larry Syma | 02 OF (Agency/Organization): Nassau Co. Dept. of Health | 03 TELEPHONE NUMBER: (516) 535-2285

04 PERSON RESPONSIBLE FOR ASSESSMENT: Michael Akerbergs | 05 AGENCY: | 06 ORGANIZATION: Woodward-Clyde Cons Inc. | 07 TELEPHONE NUMBER: ~~212 926-2878~~ (201) 785-0700 | 08 DATE: 2 / 25 / 85 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	none

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ■ A. SOLID
- ☐ B. POWDER, FINES
- ☐ C. SLUDGE
- ☐ D. OTHER ______ (Specify)
- ☐ E. SLURRY
- ■ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS unknown

CUBIC YARDS ______

NO. OF DRUMS ______

03 WASTE CHARACTERISTICS (Check all that apply)

- ☐ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☐ D. PERSISTENT
- ☐ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☐ G. FLAMMABLE
- ☐ H. IGNITABLE
- ☐ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

unknown

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS		unknown	
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
		unknown			

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Nassau County Dept. of Health files

NYSDEC Region 1 files

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: NY
02 SITE NUMBER: none

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ■ A. GROUNDWATER CONTAMINATION
02 ☐ OBSERVED (DATE: ______) ■ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: unknown
04 NARRATIVE DESCRIPTION

Potential for contamination of near-surface groundwater which is not currently used in vicinity. Potential for contamination of deeper Magothy aquifer is small due to confining layers above the Magothy.

01 ■ B. SURFACE WATER CONTAMINATION
02 ☐ OBSERVED (DATE: ______) ■ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: unknown
04 NARRATIVE DESCRIPTION

Site is bounded on three sides by water. Outfall from incinerators has concentrations of heavy metals

01 ■ C. CONTAMINATION OF AIR
02 ■ OBSERVED (DATE: 9/31/83) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: unknown
04 NARRATIVE DESCRIPTION

Concentrations above background of methanol detected 1000 ft downwind of site.

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS
02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______
04 NARRATIVE DESCRIPTION

no information available (nia)

01 ☐ E. DIRECT CONTACT
02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______
04 NARRATIVE DESCRIPTION

nia

01 ☐ F. CONTAMINATION OF SOIL
02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: ______ (Acres)
04 NARRATIVE DESCRIPTION

nia

01 ☐ G. DRINKING WATER CONTAMINATION
02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______
04 NARRATIVE DESCRIPTION

nia

01 ☐ H. WORKER EXPOSURE/INJURY
02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: ______
04 NARRATIVE DESCRIPTION

nia

01 ☐ I. POPULATION EXPOSURE/INJURY
02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______
04 NARRATIVE DESCRIPTION

nia

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	none

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

no information available (n/a)

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (include name(s) of species)

n/a

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION.

n/a

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills/runoff/standing liquids/leaking drums) — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

n/a

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

n/a

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

n/a

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

n/a

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

n/a

III. TOTAL POPULATION POTENTIALLY AFFECTED: ______

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Nassau Co Dept. of Health files
NYSDEC Region I files

2.4 EPA Form 2070-13 (Site Inspection Report)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	[illegible]

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Merrick Landfill	1600 Merrick Road

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
Merrick	NY	11566	Nassau		

09 COORDINATES LATITUDE	LONGITUDE	10 TYPE OF OWNERSHIP (Check one)
40 37 08.	073 33 42.	☐ A. PRIVATE ☐ B. FEDERAL ☐ C. STATE ☐ D. COUNTY ☒ E. MUNICIPAL ☐ F. OTHER ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION (MONTH DAY YEAR)	02 SITE STATUS	03 YEARS OF OPERATION
1 13 85	☐ ACTIVE ☒ INACTIVE	1950 (BEGINNING YEAR) / 1984 (ENDING YEAR) ___ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply)

☐ A. EPA ☐ B. EPA CONTRACTOR ______ (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR ______ (Name of firm)

☐ E. STATE ☒ F. STATE CONTRACTOR Woodward-Clyde Consultants, Inc. (Name of firm) ☐ G. OTHER ______ (Specify)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
David Muscalo	Senior Staff Geologist	Woodward Clyde	(201) 785-0700

09 OTHER INSPECTORS	10 TITLE	11 ORGANIZATION	12 TELEPHONE NO.
Michael Akerbergs	Assistant Project Geologist	same	( ) same
			( )
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO.
James Heil	Commissioner of Sanitation	Town Hall Plaza, Main St. Hempstead	(516) 378-4210
Al Albanese	Deputy Commissioner	same	( ) same
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT	0800	Partly cloudy, cold

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO.
Larry Suna	Nassau County Dept. of Health	(516) 535-2185

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE (MONTH DAY YEAR)
Michael Akerbergs		Woodward-Clyde Consultants Inc.	212-926-2878 201-785-0700	2 25 85

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	none

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☒ A. SOLID
- ☐ B. POWDER, FINES
- ☐ C. SLUDGE
- ☐ D. OTHER ________ (Specify)
- ☐ E. SLURRY
- ☒ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

- TONS: unknown
- CUBIC YARDS: ________
- NO. OF DRUMS: ________

03 WASTE CHARACTERISTICS (Check all that apply)

- ☐ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☐ D. PERSISTENT
- ☐ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☐ G. FLAMMABLE
- ☐ H. IGNITABLE
- ☐ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

unknown

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES		unknown	
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
			unknown		

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Nassau Co. Dept. of Health files
NYDEC Region 1 files

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	none

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION
02 ☐ OBSERVED (DATE: ________) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: unknown
04 NARRATIVE DESCRIPTION

Potential for contamination of near-surface groundwater which is not currently used in vicinity. Potential for contamination of deeper Magothy aquifer is small due to confining layers above the Magothy.

01 ☒ B. SURFACE WATER CONTAMINATION
02 ☐ OBSERVED (DATE: ________) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: unknown
04 NARRATIVE DESCRIPTION

Site is bounded on three sides by water. Outfall from incinerator has concentrations of heavy metals.

01 ☒ C. CONTAMINATION OF AIR
02 ☒ OBSERVED (DATE: 9/21/82) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: unknown
04 NARRATIVE DESCRIPTION

Concentrations above background of methanol detected 1000' downwind of site.

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS
02 ☐ OBSERVED (DATE: ________) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ________
04 NARRATIVE DESCRIPTION

no information available (nia)

01 ☐ E. DIRECT CONTACT
02 ☐ OBSERVED (DATE: ________) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ________
04 NARRATIVE DESCRIPTION

nia

01 ☐ F. CONTAMINATION OF SOIL
02 ☐ OBSERVED (DATE: ________) ☐ POTENTIAL ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: ________ (Acres)
04 NARRATIVE DESCRIPTION

nia

01 ☐ G. DRINKING WATER CONTAMINATION
02 ☐ OBSERVED (DATE: ________) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ________
04 NARRATIVE DESCRIPTION

nia

01 ☐ H. WORKER EXPOSURE/INJURY
02 ☐ OBSERVED (DATE: ________) ☐ POTENTIAL ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: ________
04 NARRATIVE DESCRIPTION

nia

01 ☐ I. POPULATION EXPOSURE/INJURY
02 ☐ OBSERVED (DATE: ________) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ________
04 NARRATIVE DESCRIPTION

nia

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	none

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

no information (nia) available

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (include name(s) of species)

nia.

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

nia

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills/Runoff/Standing liquids, Leaking drums) — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

nia

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

nia

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

nia

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: ______) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

nia

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

nia

III. TOTAL POPULATION POTENTIALLY AFFECTED: ______

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Nassau County Dept of Health files
NYDEC Region 1 files

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	none

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES				
☐ B. UIC				
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☐ G. STATE (Specify)				
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
■ J. NONE	SPDES permit applied for in 1979			

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
■ A. SURFACE IMPOUNDMENT	lagoons - machine rehabilitated	
☐ B. PILES		
☐ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND		
■ F. LANDFILL	82	acres
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☐ I. OTHER (Specify)		

04 TREATMENT (Check all that apply)
- ■ A. INCENERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER (Specify)

05 OTHER
- ■ A. BUILDINGS ON SITE: garage, shops, transfer sta. etc.

06 AREA OF SITE: 82 (Acres)

07 COMMENTS

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☐ B. MODERATE ■ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

none

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE: ☐ YES ■ NO

02 COMMENTS: site is fenced except for areas along water

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Nassau County Dept. of Health files
NYSDEC Region 1 files

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE: NY | 02 SITE NUMBER: none

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)

	SURFACE	WELL
COMMUNITY	A. ☐	B. ■
NON-COMMUNITY	C. ☐	D. ☐

02 STATUS

ENDANGERED	AFFECTED	MONITORED
A. ☐	B. ☐	C. ■
D. ☐	E. ☐	F. ☐

03 DISTANCE TO SITE

A. 1.5 (mi)
B. ______ (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

■ A. ONLY SOURCE FOR DRINKING
☐ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available)
☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available)
☐ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER 470,000 from wells within 3 miles

03 DISTANCE TO NEAREST DRINKING WATER WELL 2.5 (mi)

04 DEPTH TO GROUNDWATER 5 (ft)

05 DIRECTION OF GROUNDWATER FLOW south

06 DEPTH TO AQUIFER OF CONCERN 60 (ft)

07 POTENTIAL YIELD OF AQUIFER unknown (gpd)

08 SOLE SOURCE AQUIFER ■ YES ☐ NO

09 DESCRIPTION OF WELLS (including useage, depth, and location relative to population and buildings)

Water supply wells for Freeport Village, Long Island Water Corporation and New York Water Service within 3 miles of site.

10 RECHARGE AREA
☐ YES
■ NO
COMMENTS

11 DISCHARGE AREA
■ YES
☐ NO
COMMENTS discharge into Merrick Bay

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

■ A. RESERVOIR, RECREATION DRINKING WATER SOURCE
☐ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES
☐ C. COMMERCIAL, INDUSTRIAL
☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
Merrick Bay	☐	0 (mi)
	☐	(mi)
	☐	(mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE A. 16593 NO. OF PERSONS

TWO (2) MILES OF SITE B. 75336 NO. OF PERSONS

~~THREE (3)~~ Four 4 MILES OF SITE C. 246835 NO. OF PERSONS

02 DISTANCE TO NEAREST POPULATION 0.34 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE more than 3000

04 DISTANCE TO NEAREST OFF-SITE BUILDING 0.05 (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

population includes residential, densely populated urban area.

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	none

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. $10^{-6} - 10^{-8}$ cm/sec ☐ B. $10^{-4} - 10^{-6}$ cm/sec ☐ C. $10^{-4} - 10^{-3}$ cm/sec ☒ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec) ☒ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm/sec) ☐ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm/sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK: greater than 1000 (ft)

04 DEPTH OF CONTAMINATED SOIL ZONE: unknown (ft)

05 SOIL pH: unknown

06 NET PRECIPITATION: 13 (in)

07 ONE YEAR 24 HOUR RAINFALL: 2.7 (in)

08 SLOPE
SITE SLOPE: >10 %
DIRECTION OF SITE SLOPE: all directions
TERRAIN AVERAGE SLOPE: not applicable %

09 FLOOD POTENTIAL
SITE IS IN not applicable YEAR FLOODPLAIN

10 ☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE A. ________ (mi)
OTHER B. 0.40 (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)
none (mi)
ENDANGERED SPECIES: ________

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL
A. 0.70 (mi)

RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES
B. 0.34 (mi)

AGRICULTURAL LANDS
PRIME AG LAND C. ________ (mi) AG LAND D. ________ (mi)
greater than one mile

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

site is a municipal landfill rising above the surrounding terrain. Surface drainage includes ponding and internal drainage on top of the landfill and radial drainage into the surrounding bay waters down the slopes of the landfill.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Nassau Co. Dept. of Health files
NYDEC Region I files

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	none

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER			
SURFACE WATER		none	
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS
Organic Vapor Analyzer	greater than 300 ppm in Johnson wax drum
	up to 300 ppm above leachate
HNU	less than 1 ppm above leachate

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☐ GROUND ■ AERIAL

02 IN CUSTODY OF Nassau County Dept of Sanitation (Name of organization or individual)

03 MAPS ■ YES ☐ NO

04 LOCATION OF MAPS Nassau Co. Dept of Sanitation

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

none

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Nassau County Dept of Health files

NYDEC Region I files

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	none

II. CURRENT OWNER(S)

01 NAME		02 D+B NUMBER
Town of Hempstead		
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE
Town Hall Plaza, Main St.		
05 CITY	06 STATE	07 ZIP CODE
Hempstead	NY	11550
01 NAME		02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE
01 NAME		02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE
01 NAME		02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE

PARENT COMPANY (If applicable)

08 NAME		09 D+B NUMBER
no information available		
10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE
12 CITY	13 STATE	14 ZIP CODE
08 NAME		09 D+B NUMBER
10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE
12 CITY	13 STATE	14 ZIP CODE
08 NAME		09 D+B NUMBER
10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE
12 CITY	13 STATE	14 ZIP CODE
08 NAME		09 D+B NUMBER
10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE
12 CITY	13 STATE	14 ZIP CODE

III. PREVIOUS OWNER(S) (List most recent first)

01 NAME		02 D+B NUMBER
no information available		
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE
01 NAME		02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE
01 NAME		02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE

IV. REALTY OWNER(S) (If applicable; list most recent first)

01 NAME		02 D+B NUMBER
no information available		
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE
01 NAME		02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE
01 NAME		02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Nassau County Dept of Health Files
NYDEC Region I files

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

EPA

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	none

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER

OPERATOR'S PARENT COMPANY (If applicable)

10 NAME	11 D+B NUMBER
no information available	

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

III. PREVIOUS OPERATOR(S) (List most recent first, provide only if different from owner)

01 NAME	02 D+B NUMBER
no information available	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)

10 NAME	11 D+B NUMBER
no information available	

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Nassau County Dept. of Health files
NYDEC Region I files

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	[illegible]

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
no information available			
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY / 06 STATE / 07 ZIP CODE		05 CITY / 06 STATE / 07 ZIP CODE	
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY / 06 STATE / 07 ZIP CODE		05 CITY / 06 STATE / 07 ZIP CODE	

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
no information available			
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY / 06 STATE / 07 ZIP CODE		05 CITY / 06 STATE / 07 ZIP CODE	
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY / 06 STATE / 07 ZIP CODE		05 CITY / 06 STATE / 07 ZIP CODE	

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Nassau County Dept. of Health files
NYDEC Region I files

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	none

II. PAST RESPONSE ACTIVITIES

01 ☐ A. WATER SUPPLY CLOSED — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
no information available (n/a)

01 ☐ B. TEMPORARY WATER SUPPLY PROVIDED — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
n/a

01 ☐ C. PERMANENT WATER SUPPLY PROVIDED — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
n/a

01 ☐ D. SPILLED MATERIAL REMOVED — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
n/a

01 ☐ E. CONTAMINATED SOIL REMOVED — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
n/a

01 ☐ F. WASTE REPACKAGED — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
n/a

01 ☐ G. WASTE DISPOSED ELSEWHERE — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
n/a

01 ☐ H. ON SITE BURIAL — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
n/a

01 ☐ I. IN SITU CHEMICAL TREATMENT — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
n/a

01 ☐ J. IN SITU BIOLOGICAL TREATMENT — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
n/a

01 ☐ K. IN SITU PHYSICAL TREATMENT — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
n/a

01 ☐ L. ENCAPSULATION — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
n/a

01 ☐ M. EMERGENCY WASTE TREATMENT — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
n/a

01 ☐ N. CUTOFF WALLS — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
n/a

01 ☐ O. EMERGENCY DIKING/SURFACE WATER DIVERSION — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
n/a

01 ☐ P. CUTOFF TRENCHES/SUMP — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
n/a

01 ☐ Q. SUBSURFACE CUTOFF WALL — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
n/a

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	none

II PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
no information available (n/a)

01 ■ S. CAPPING/COVERING 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
capping-closure plan prepared in response to consent order has been submitted

01 ☐ T. BULK TANKAGE REPAIRED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
n/a

01 ☐ U. GROUT CURTAIN CONSTRUCTED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
n/a

01 ☐ V. BOTTOM SEALED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
n/a

01 ■ W. GAS CONTROL 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
methane monitoring wells

01 ☐ X. FIRE CONTROL 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
n/a

01 ☐ Y. LEACHATE TREATMENT 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
n/a

01 ☐ Z. AREA EVACUATED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
n/a

01 ☐ 1. ACCESS TO SITE RESTRICTED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
n/a

01 ☐ 2. POPULATION RELOCATED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
n/a

01 ☐ 3. OTHER REMEDIAL ACTIVITIES 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Nassau County Dept. of Health Files
NYDEC Region I files.

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	[illegible]

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☐ YES ☐ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

NYSDEC order on consent to prepare capping - closure plan

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Nassau County Dept. of Health files
NYSDEC Region 1 files

EPA FORM 2070-13 (7-81)

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TABLE I

SOURCES OF INFORMATION

Data Gathered	Office/ Agency	Location	Contact Person	Date of Visit	Date of Phone Conversation	Telephone Number
Critical Habitats	NYSDEC Division of Fish & Wildlife Significant Habitats Unit	Wildlife Resources Center Delmar, NY 12054	Larry Brown	12-11-84	several, 12/84	(518) 439-7486
Site Specific Information	NYSDEC Division of Solid and Hazardous Waste, Bureau of Municipal Waste	3 Vatrano Road Albany, NY	Hans Dirzuweit Earl Barcomb	12-12-84- 12-14-84	several, 12/84	(518) 457-2051
Historic/ Landmark Sites	NYS Dept. of Parks, Recreation & Historic Preservation Division for Historic Preservation	Agency Bldg #1 Empire State Plaza Albany, NY 12238	Lenore Kuwick	12-12-84	various, 12/84	(518) 474-3176
Wetlands	NYSDEC Division of Fish & Wildlife, Habitat Inventory Unit	Albany, NY	Sharon O'Connor		12/84	(518) 457-3431
Freshwater & Coastal Wetlands in Nassau & Suffolk Counties	NYSDEC-Region I	Bldg #40 SUNY Stony Brook, NY 11794	Mike Fiscina		several, 12/84; 1/85	(516) 751-1389
Freshwater and Coastal Wetlands in Kings County	NYSDEC-Region II	2 World Trade Center Rm 6126 New York, NY 10047	Joe Pane		various, 12/84	(212) 488-2758
Freshwater and Coastal Wetlands in Albany and Rensselaer Counties	NYSDEC-Region IV	Rt. 10, Stamford, New York 12167	Maynard Vance		various, 12/84	(607) 652-7364
Site Specific Information	NYS Dept. of Health Division of Health Risk Control, Bureau of Toxic Substance Assessment	Corning Tower Bldg., ESP Albany, NY 12237	Ron Tramontano Steve Bates	12-12-84	various, 12/84	(518) 473-8427
Site Specific Information- Rensselaer County Sites	NYS Law Department	Justice Bldg.-Rm 245 Albany, NY 13224	Michael Moore	12-12-84	various 12/84; 2/85	(518) 474-1190
Agricultural/ Prime Agri- cultural Land in Production	NYS Dept. of Agriculture and Markets, Divison of Rural Affairs	State Campus Bldg. No. 8, Room 805 Albany, NY 12235	Louise Inglis	12-13-84	various, 12/84	(518) 457-2713
Water Resources	NYSDEC Division of Water Resources	50 Wolf Road Albany, NY 12233		12-14-84	various, 12/84	(518) 457-5668

TABLE I

SOURCES OF INFORMATION
(continued)

Data Gathered	Office/ Agency	Location	Contact Person	Date of Visit	Date of Phone Conversation	Telephone Number
Site Specific Information	NYSDEC Division of Solid & Hazardous Waste	50 Wolf Rd. Albany, NY 12233	Anita Grikstas	12-14-84		(518) 457-0639
Site Specific Information-Rensselaer County Sites	Rensselaer County Health Dept.	County Office Bldg. 1600 7th Ave. Troy, NY 12180	John Sheehan	12-27-84	several, 12/84; 2/85	(518) 270-2670
Site Specific Information-Albany County Sites	Albany County Health Dept.	South Ferry and Green Streets Albany, NY 12201	Cliff Forando Steve Lukowski Ben Pierson	12-28-84	several, 12/84	(518) 445-7835
Site Enforcement	NYSDEC Division of Environmental Enforcement	202 Mamaroneck Ave. White Plains, NY 10601	Mike Tone		several, 12/84; 1/85	(914) 761-6660
USEPA "ERRIS" Site Numbers	USEPA-Region II Hazardous Waste Site Branch	26 Federal Plaza New York, NY 10278	Carol Peterson Kathy Moyik		several, 12/84; 1/85	(212) 264-4197 (212) 264-8672
Site Specific Information-Albany and Rensselaer County Sites	NYSDEC-Region IV	2176 Guilderland Ave. Schenectady, NY 12306	George Elston Mike Styk		various, 12/84; 1/85	(518) 382-0680
Site Specific Information-Suffolk County Sites	Suffolk Co. Dept. of Health Services	15 Horse Block Pl. Farmingville, NY	Frank Randall Jim Pim Jim Maloney		various 11/84; 12/84	(516) 451-4633
Site Specific Information-Nassau County Sites	Nassau Co. Dept. of Health	240 Old Country Road Mineola, NY	Joe Schechter Larry Sang	12/13/84		(516) 535-2406
Water Supply in Suffolk Co.	Suffolk Co. Dept. of Health Services	225 Rabro Dr. East Hauppauge, NY 11788	Paul Panturo Richard Meyer		12/7/84	(516) 348-2886
Site Specific Information-Kings County Sites	NYSDEC Region II	2 World Trade Center New York, NY	Armand DeAngelis Sal Ervolino	12/7/84	(212) 488-3862 12/26/84	
Site Specific Information-Kings County Sites	NYCDEP	2358 Municipal Bldg. New York, NY 10007	Tim Slauson Anthony Ianarelli Stacy Moriates Stan Cepenberg Kim Sparber		12/27/84 12/20/84 12/7/84 12/10/84 12/10/84	(212) 669-8934 (212) 669-8939 (212) 566-8977 (212) 566-2717 (212) 566-1647
Site Specific Information-NYSDEC Region I & II Sites	NYSDEC Region I	Building 40 SUNY at Stonybrook	Bob Schneck Bob Becherer	various 12/84		(515) 751-7900
Well Points NYSDEC Region I & II Sites	NYSDEC Region I Well Points	Building 40 SUNY at Stonybrook	Tony Candella	12/12/84		(516) 751-7900

E78/205

The Merrick Landfill is a municipal landfill located on the south shore of Nassau County, Long Island in a generally residential/commercial area of Merrick, New York. It is bounded on the west by a narrow marshy inlet of Merrick Bay. Merrick Road Park lies between the site and Mud Creek, a tidal inlet of Merrick Bay, on the east. The southern tip lies adjacent to Merrick Bay. The incinerator and lagoons (presently inactive) and the administrative buildings are to the north, separated from the landfill by fences. Access to the site is by way of an entrance road off of Merrick Road which runs adjacent to the administrative building area on the north.

The landfill rises to over 100 feet above the surrounding terrain which is close to sea level. It covers 82 acres and contains about 3 million cubic yards of waste. The landfill had been closed in 1984 and was, therefore, inactive at the time of the WCCI site visit.

During the site visit, numerous leachate seeps were observed along the perimeter road as well as along the road to the top of the landfill. Leachate was not observed discharging directly into surrounding waters. Side slopes were steep, often exceeding 50% and vegetative cover was fair. Although the waste is generally well covered, garbage can be seen protruding from beneath the cover in spots. Areas of surface water ponding were evident and there is a potential for erosion along the top as well as on the slopes.

The U.S. EPA concluded, that based on a brief air quality survey conducted with several municipal and state agencies, since no compounds were detected at levels generally considered significant or unsafe there were no major influences on the surrounding environment. More data, however, is needed to conlcusively make such a determination.

4.1 SITE AREA SURFACE FEATURES

The Merrick Landfill is an 82-acre municipal landfill, presently inactive, located on East Bay on the south shore of Long Island. It is bounded by a narrow marshy inlet and the Meadowbrook State Parkway on the west, administrative buildings and Merrick Road on the north, Merrick Road Park and Mud Creek on the east and Merrick Bay on the south. The site perimeter is either fenced or adjacent open water. Access to the site is, therefore, restricted.

The elevation of the landfill ranges from sea level at Merrick Bay to over 125 feet on the top. The slopes are steep, often exceeding 50%. Although the landfill has been closed and part of the area has been seeded, rill erosion of less than adequately vegetated areas and partially covered garbage are evident throughout the site.

Leachate has been observed at numerous points at the bottom of the slopes along the perimeter road and the road to the top of the landfill. During the site visit, however, leachate was not seen discharging directly into surface water.

The site vicinity is largely residential/commercial although the closest residence is about 2000 feet away. The site is bounded by wetlands and tidal flats along the western and southern boundaries. None of these areas, however, have been designated as signifciant habitats by New York State, but several controlled clamming areas are located in Merrick Bay near the southern boundary of the landfill.

4.2 SITE HYDROGEOLOGY

4.2.1 Ground-Water Occurrence

There are two major water bearing units in the site vicinity. The "principal aquifer" as defined by Isbister (1966) includes all beds overlying the Upper Cretaceous clay member of the Raritan Formation. In the site area, this includes the upper glacial Pleistocene deposits and the Magothy Formation, which is a major aquifer throughout much of Long Island.

The Upper Pleistocene deposits consist mainly of glacial outwash materials. Highly permeable outwash deposits of fine to coarse and and gravel are exposed at the surface and extend to depths between 45 feet and 65 feet. Beneath this outwash the relatively thin bed of marine clay ("20-foot" clay) forms a barrier between unconfined salty water above confined fresh water below.

Beneath the Pleistocene deposits near the western edge of the study area are the Gardiners clay and the Jameco gravel. Flow in Jameco gravel, which consists primarily of coarse sand and gravel, is confined above it by the low permeability Gardiners clay.

The Magothy Formation, which underlies all of these deposits and forms the principal confined freshwater aquifer for the area, contains alternating beds of mixtures of gravel, sand, silt and clay.

There are about 40 feet of sand and gravel deposits beneath the Merrick Landfill site. The "20 foot" clay is about 18 feet thick below these outwash deposits and acts as a confining bed for the deeper Magothy Formation. This clay also restricts vertical flow between the two aquifers. The Gardiners clay is not present beneath the northern part of the site but may appear further south.

Hydrogeologic conditions at the Merrick Landfill are similar to those at the Oceanside Landfill site which is located about four miles to the west. Hydrologic conditions at both landfills are discussed in Geraghty and Miller (1981). Ground water flow in the upper glacial aquifer is generally to the south. There is probably a small vertical flow component but the "20 foot" clay retards vertical flow, both up and down. Measured water levels in the shallow and deep wells of well pairs installed and monitored by the USGS show the heads measured in wells completed in the Magothy Formation to be greater than the heads in the unconfined glacial deposits (Geraghty & Miller, 1981). The vertical component of ground water flow is, therefore, upward, from the Magothy into the upper glaical aquifer.

In the vicinity of the site, shallow ground water flow in the upper glacial aquifer is generally toward the south with ground water levels at several feet above sea level. It is likely that the Merrick Landfill has created a local recharge area and a certain amount of ground water mounding can be expected at the site. This mounding forms a radial flow pattern toward the edge of the landfill. Some of this local flow merges as leachate while a portion may be carried deeper and discharged into the ocean directly.

4.2.2 Ground Water Quality

Ground water quality in Nassau County is generally good, typically less than 100 ppm dissolved solids. Locally high nitrate concentrations have been reported in both the shallow aquifer and the deep confined aquifer in Nassau County. The primary source for this nitrate contamination is believed to be sanitary systems, particularly cesspools, with some contribution from chemical fertilizers (Myott, 1980).

Organic chemicals have been detected throughout the ground water system in Nassau County in both the principal aquifer and the deep confined aquifer. Highest concentrations have been found in industrialized areas and in shallow wells. The most frequently detected organic chemical contaminants in 1978 were chloroform, tetrachlorethylene, 1,1,1-trichloroethane, and trichloroethylene. Concentrations of total organics exceeded 50 ppb in 52 of Nassau County's 442 public supply wells. Thirtyfour public supply wells have been classified as restricted (extreme emergency use only) by the Nassau County Department of Health, because of high levels of contamination.

4.2.3 Ground Water Use

Due to its brackishness, water from the upper glacial aquifer is not used for drinking in the vicinity of the site. There are, however, a number of shallow wells drawing water for irrigation and institutional use.

The Magothy aquifer is the major source of water in the area as it is for most of Long Island. There are no water supply wells within one mile of the site. The closest are Freeport's and New York Water Service's well fields north of Sunrise Highway. These well fields are hydrogeologicaly upgradient of the site.

4.3 PAST SAMPLING AND ANALYSIS

There has been little environmental sampling at Merrick Landfill in the past. Incinerator emission and outfall data had been routinely collected at Merrick Landfill for many years (see Juczak and Schafer, 1985 in Appendix B). Concern about the environmental effects of the Hempstead Municipal Landfills during recent years has prompted an increase in data collection at both the Oceanside and Merrick landfills. The increased effort resulted in the publishing of several studies completed not long ago in which the effects of the landfill on surrounding air and water quality were evaluated. The U.S. Environmental Protection Agency, New York Department of Environmental Conservation, Nassau County Department of Health and the Town of Hempstead participated in these studies. Although most of the efforts were concentrated on the Oceanside Landfill, some data were collected for Merrick and are reported in USEPA, 1984 (Summary excerpts are included in Appendix B)

DATA ADEQUACY

Available data was generally adequate for all items except for waste characteristics. There are essentially no data on toxicity, persistence or hazardous waste quantity at the site. The score of 18 for Toxicity/Persistence was based on isolated reports of heavy metals in incinerator emissions in the past. The hazardous waste quantity score is the highest jutifiable score based on the fact that hazardous substances are known to exist on the site.

In spite of this deficiency in available data, from what is known about route characteristics and targets (ground water withdrawal is from the deeper Magothy aquifer that is hydraulically isolated from the upper glacial aquifer in the area; surface water not used for drinking in area) even if the maximum score was given for hazardous waste quantity, the ground water and surface water scores would increase only a relatively small amount.

6.1 OBJECTIVES

The objective of this proposed work plan is to collect field information required to prepare a final HRS score and develop conceptual remedial designs and cost estimates. Information on general site conditions has been obtained as part of Phase I work. Ground water in the site vicinity is close to the surface within the upper glacial deposits. These deposits are about 40 feet thick at the site. The upper glacial aquifer is not used for drinking water in the vicinity of the site. Below this aquifer lies the Magothy formation separated from the upper glacial aquifer by approximately 20 feet of clay. The Magothy is a principal water source on Long Island. The work plan will primarily address the nature and extent of site contamination, ground-water flow and quality, the interconnection between the upper glacial aquifer and the Magothy aquifer, and surface-water flow and quality.

6.2 FIELD INVESTIGATION PLAN

6.2.1 Preliminary Site Investigations

A preliminary site visit will be made to tentatively select the monitoring-well locations, to evaluate the means of drill rig access in each case, and to identify property owners if access is required off site. In addition, a thorough site reconnaissance will be performed, and a survey of volatile organic emissions will be conducted close to all exposed barrels, using an HNU meter, Model PI 101. It is estimated that 2 person-days will be required for this work.

6.2.2 Geophysical Studies

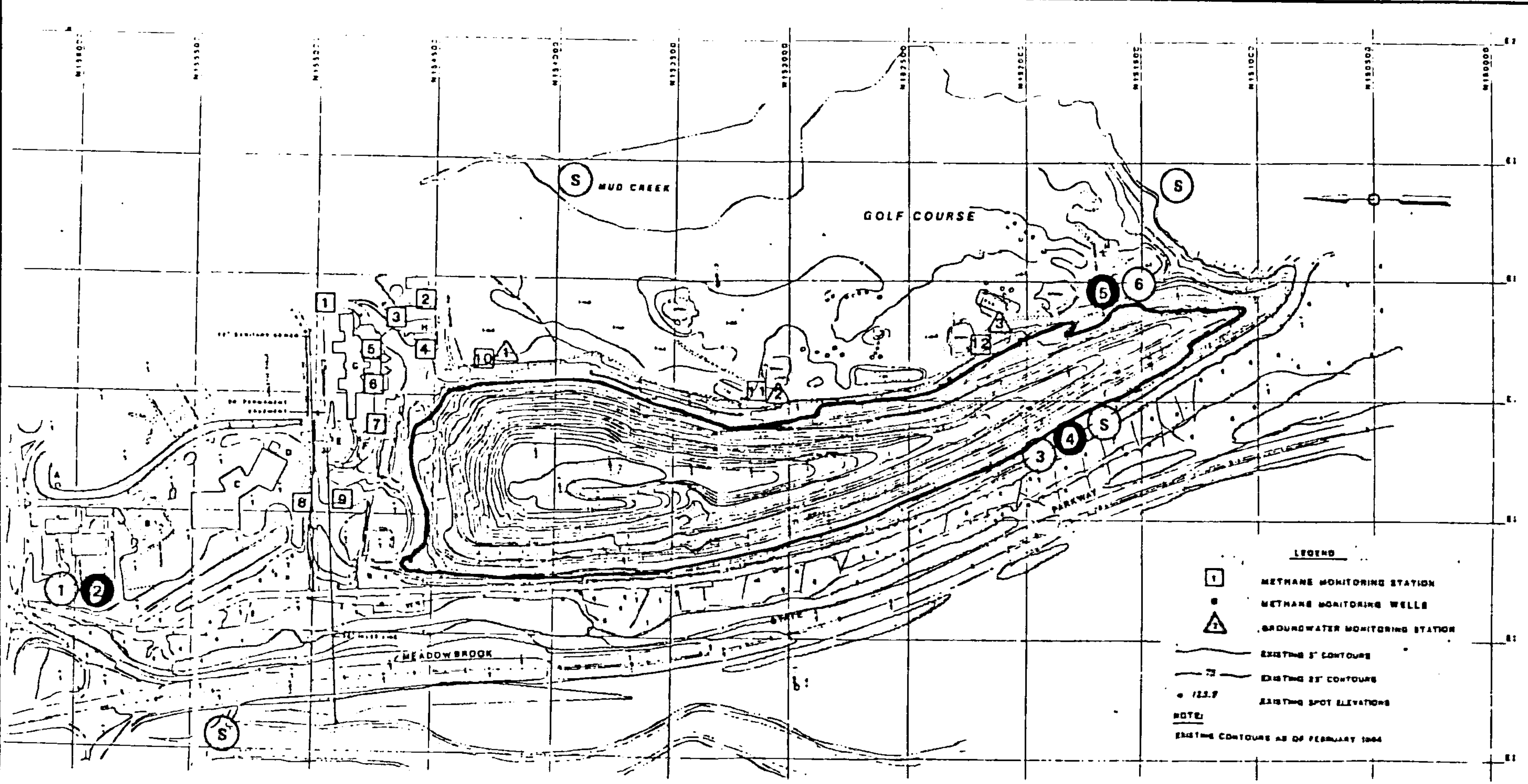
A geophysical survey utilizing the terrain conductivity technique will be performed at the site to aid in characterizing the hydrologic regime. This technique has been utilized successfully in locating subsurface plumes of many different substances, including hydrocarbons and metals in landfill leachate. Measurements will be taken at various locations around the site to determine expected ranges of background or upgradient conductivity. Measurements will be taken across the dump site to identify anomalous conductivity distributions that may indicate buried metallic objects such as drums. Because of the large area of the site and its proximity to the water, the conductivity survey will be restricted mostly to on-site locations such as the perimeter road where leachate seeps are known to exist, and traverse across the top of the landfill.

It is estimated that a two person team will require 4 days including travel time, to perform the conductivity survey, with readings taken for exploration depths of 3 and 6 meters at each measurement station. The data will be plotted on maps and contoured. These contour maps will provide the basis for defining the exact location of ground water monitoring wells.

6.2.3 Monitoring Wells

6.2.3.1 Installation. Monitoring wells will be installed to provide data pertinent to both water chemistry and the stratigraphy and the ground water regime at the site. It is recommended that 6 monitoring wells be installed at the approximate locations shown in Figure 2. Final well locations will be determined after the conductivity survey is completed.

Nested well pairs will be installed at three locations (MW-1-2, 3-4 and 5-6). Each well pair will consist of a shallow well completed in the upper aquifer and a deeper well completed in the Magothy aquifer. Installing the wells in such a manner will provide information on the hydraulic connection between the two aquifers and whether or not the upper aquifer and, in turn, the Magothy have



LEGEND

SOURCE: FIGURE 3-1 IN VELZY ASSOCIATES, 1984

SHALLOW–UPPER AQUIFER WELL

DEEP–MAGOTHY AQUIFER WELL

SURFACE WATER–SEDIMENT SAMPLE

LEACHATE SAMPLE LOCATION (APPROX)

0 500 1000 FT

SCALE

DEPARTMENT OF ENVIRONMENTAL CONSERVATION · NEW YORK STATE

Prepared for
NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
50 Wolf Road, Albany, New York 12233
Henry G. Williams, Commissioner

Division of Solid and Hazardous Waste
Norman H. Nosenchuck, P.E.
Director

Approved

LOCATION PLAN
FOR PROPOSED PHASE II INVESTIGATION
MERRICK LANDFILL

Prepared by
WOODWARD–CLYDE CONSULTANTS, INC.
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
NEW YORK, NEW YORK

DR BY	BTD	SCALE	AS SHOWN	PROJ NO	82C4548-3
CKD BY	MA	DATE	26 MAR 1985	FIG NO	2

been contaminated. Well pair MW-1-2 will be installed in a presumed upgradient location but far enough off the landfill to be outside any ground water mounding influence. These wells will provide background data on the ground water flowing into the area. The remaining shallow wells can all be considered downgradient since the mounding of ground water within the landfill will produce a radial pattern of ground water flow from the center of the landfill. Magothy wells MW-4 and MW-5 will, again, provide information on vertical extent of contamination and hydraulic gradients at these points.

All monitoring wells will be installed so as to sample the upper 10 feet of the aquifers. Ground water is shallow within the upper aquifer, less than 10 feet below the surface. The shallow wells should therefore, average about 20 feet. The three Magothy wells will be installed so as to sample just below the confining clay and will be an estimated 70 feet deep.

Borings will be advanced through overburden by 4-inch I.D. hollow stem augers or driven casing. Split-spoon samples will be obtained at 5 foot intervals. Blow counts will be recorded during each sampling. Soil samples will be classified in the field by a hydrogeologist using the Unified Soil Classification system. Selected samples will be sent to our geotechnical laboratory for grain-size analysis, Atterberg tests and soil-moisture determinations. To maximize information on any volatile organic contaminants, headspace surveys will be conducted on soil samples using a portable HNU meter, Model PI 101. These data will be used to evaluate relative concentrations of organic contaminants in various stratigraphic horizons. Where necessary, borings will be advanced through rock by 3-inch diameter roller bit or percussion bit.

Slotted 2-inch I.D. PVC well screen will be installed over 10-foot intervals in each overburden well, with a riser casing of flush joint, threaded, 2-inch I.D. PVC pipe. In low-lying areas, risers will extend at least 3 feet above the ground surface to prevent contamination by surface-water flooding. A gravel pack will be completed to approximately 2 feet above the top of the screen, where a 1-

foot bentonite seal will be emplaced. To further assure that water samples will be representative of the screened interval, the remaining annular space will be grouted, and a protective steel casing will be installed. After installation, any wells completed in overburden will be developed by pumping, to remove any fine-grained material.

It is estimated that 15 working days will be required to perform inspection during the drilling and well installation operations and for surveying well elevations, for headspace analysis of soil samples, for slug-type permeability testing in each well, and plotting data.

6.2.3.2 Water Elevations. Ground-water depths will be measured at the time of well development and again at the time of sampling. Relative well elevations will be surveyed by WCCI personnel or subcontractor. Water-level elevations will be plotted and used to develop contours of the ground-water table at the site. Based on this map, the direction(s) of ground-water flow will be derived.

Flow and gradient data will constitute fundamental input in quantifying site conditions and will be assessed together with the plume geometries inferred from geophysical survey data.

6.2.3.3 Aquifer Testing. "Slug"-type permeability tests will be conducted in each newly installed well to evaluate the permeability of materials spanning the screened interval. The method is a rapid means by which the in-situ permeability in the immediate vicinity of a monitoring well can be approximated. The test does not involve pumping of potentially contaminated water and results generally suffice for ground water flow analysis.

6.2.4 Sampling and Analysis Plan

6.2.4.1 General Plan. The site-specific Quality Assurance/Quality Control (QA/QC) Plan will be developed by WCCI and approved by the NYSDEC prior to commencement of work.

6.2.4.2 Sampling Parameters. Because chemical information based on previous sampling has not been reported, the laboratory analyses will focus on chemical screening techniques to determine the type and range of concentration and the migration of contaminants in ground water and surface water. Full GC/MS scans (priority pollutants plus additional peaks) will be performed on all well samples, a leachate sample and one surface water/sediment location. Samples will be collected from ground water, soils, surface water and stream sediments and leachate. Sample types and chemical parameters are summarized in Table 2.

6.2.4.3 Sampling Locations. One water sample and one soil sample from each of the six ground water monitoring wells will be analyzed. Results from each pair of analyses will be compared to evaluate any downward migration of contaminants through soil. Ground water analysis will be evaluated in terms of the hydrogeologic data to evaluate the presence, distribution, and migration directions of any ground water contamination.

Surface-water samples will be collected at four locations in Mud Creek and Merrick Bay, with sediment samples collected at the same locations. One sampling location will be upgradient of the site. This sample may provide information regarding the quality of surface water flowing into the site vicinity.

Air samples will be analyzed using an HNU or an OVA (Organic Vapor Analyzer) at upwind and downwind locations. This survey will provide information concerning concentrations of volatile organics, if any, that are being released from the site. It is estimated that 3 days, including travel time, will be required to collect all required ground-water, surface-water, and stream-sediment samples.

Table 2. PROPOSED CHEMICAL ANALYSES AT MERRICK LANDFILL

Sample Type	Metals	Volatile Organics	Full Priority Pollutant Analysis	Remarks
	ANALYSES			
Ground Water			X	One sample at each of 6 wells.
Soil	X	X		One sample from unsaturated zone at each of 6 wells.
Surface Water	X	X	X	Four samples. Full Priority Pollutant Analysis on one sample only.
Leachate			X	One sample.
Stream Sediment	X	X		Four samples. Full Priority Pollutant Analysis on one sample only.
Air		X		Upwind and downwind locations using HNU or OVA

E154.7/223

6.3 HEALTH AND SAFETY PLAN

Health and Safety procedures will conform to guidelines supplied by the NYSDEC. Health and safety apparel and equipment will be required during the field activities—preliminary site investigation, geophysical studies, drilling and monitoring-well installation and water sampling. For the purpose of costing the investigation, Level D protection is assumed. Should protective levels higher than Level D be required for any activity, costs will be revised in accordance with the unit costs indicated in the attachment provided to the NYSDEC dated April 1985.

6.4 REPORT PREPARATION

Report Preparation will involve analysis of the data as well as preparation of the text. Included in this task are the reduction, compilation and organization of the data, editing of boring logs, preparation of graphical representations, analysis and calculations, report reproduction and preparation of a final HRS score for the site. In addition, remedial concepts will be developed along with order-of-magnitude remedial costs.

6.5 COST ESTIMATE

Costs for Phase II work were developed based on NYSDEC Audit and Control Guidelines, using assumptions described in WCCI's cost proposal submitted to the NYSDEC on October 29, 1982, subsequent contract D000452 dated March 31, 1983, and the generic work plan developed by the NYSDEC. Costs have been grouped by task, and estimates are presented in Table 3. Lump sum cost arrangements will be provided for Tasks 1, 2, 3, 6 and 7. For Tasks 4 and 5, Drilling/Well Installation and Sampling and Analysis respectively, lump sum cost arrangements will be provided with the exception of drilling and well installation subcontracted costs, and chemical analytical laboratory subcontracted costs. Analytical costs include trip and field blanks, spike and replicate and shuttle costs as required by the NYSDEC QA/QC Protocol. The subcontracted cost items will be billed at cost plus five percent. Any activity that involves work or levels of effort beyond the scope of this work plan will be billed in accordance with the unit rates indicated in the attachment provided to the NYSDEC dated April 1985.

TABLE 3

ESTIMATED COSTS FOR PHASE II INVESTIGATION
MERRICK LANDFILL

TASKS	LABOR				OTHER DIRECT COSTS								TOTAL
	Hours	Direct Cost	Overhead Cost	Total Cost	Consul-tants	Sub-Con-tractors	Travel & Subsis-tence	Health & Safety Gear & App (1)	Special Testing	Special Equip-ment	Sample Shipment	Office Services (2)	
1. Work, Health & Safety and QA/QC Plans	75	1385	1593	2978			0	0		0		200	3178
2. Preliminary Investigations and Site Visit	24	441	507	948			31	140		325		0	1444
3. Geophysical Studies	102	1874	2155	4029			601	560		1050		0	6240
4. Drilling/Well Installation	150	2768	3183	5951		10960	1098	840	2387	2430	250	0	23916
5. Sampling and Analysis	60	1110	1277	2387		38650	421	350		910	650	0	43368
6. Report Preparation	156	2936	3376	6312	1500		0	0		0		1517	9329
7. Project Management	84	2082	2394	4477			662	0		0		400	5539
TOTALS	651	12596	14485	27081	1500	49610	2813	1890	2387	4715	900	2117	93013
FEE				4062	75	2481							6618
TOTAL ESTIMATED COST				31143	1575	52091	2813	1890	2387	4715	900	2117	99631

(1) Level D protection assumed.
(2) Includes direct project office costs, reproduction and postage.

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Appendix A

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Appendix B

underlain by terminal-moraine deposits, the depth to the water table is more than 50 feet, and in small areas the depth to the water table is more than 200 feet. Depths to the water table near the northern coast of the island generally are more than 20 feet, except adjacent to stream channels or in narrow bands near the shoreline.

GROUND-WATER RESERVOIR

HYDROLOGIC FEATURES OF THE GROUND-WATER RESERVOIR

The overall hydrogeologic setting of Long Island was described in considerable detail by Veatch (1906), Fuller (1914), and Suter, De Laguna, and Perlmutter (1949). The geology and related hydrology of several smaller areas of Long Island have been studied in greater detail by others, including De Laguna (1963), Isbister (1966), Lubke (1964), Lusczynski and Swarzenski (1966), Perlmutter and Geraghty (1963), Pluhowski and Kantrowitz (1964), and Swarzenski (1963).

Long Island is underlain by consolidated bedrock, which, in turn, is overlain by a wedge-shaped mass of unconsolidated rock materials (fig. 8).[1] These materials, which constitute Long Island's ground-water reservoir, consist primarily of a series of Pleistocene glacial deposits and Cretaceous fluvial or deltaic deposits composed of gravel, sand, silt, clay, and mixtures thereof. The Cretaceous deposits were eroded by

[1] The actual dip of the upper bedrock surface is slightly less than 1° to the southeast. The much greater inclination of the bedrock surface and the Magothy aquifer shown in figure 8 is due to the large vertical-scale exaggeration of this cross section.

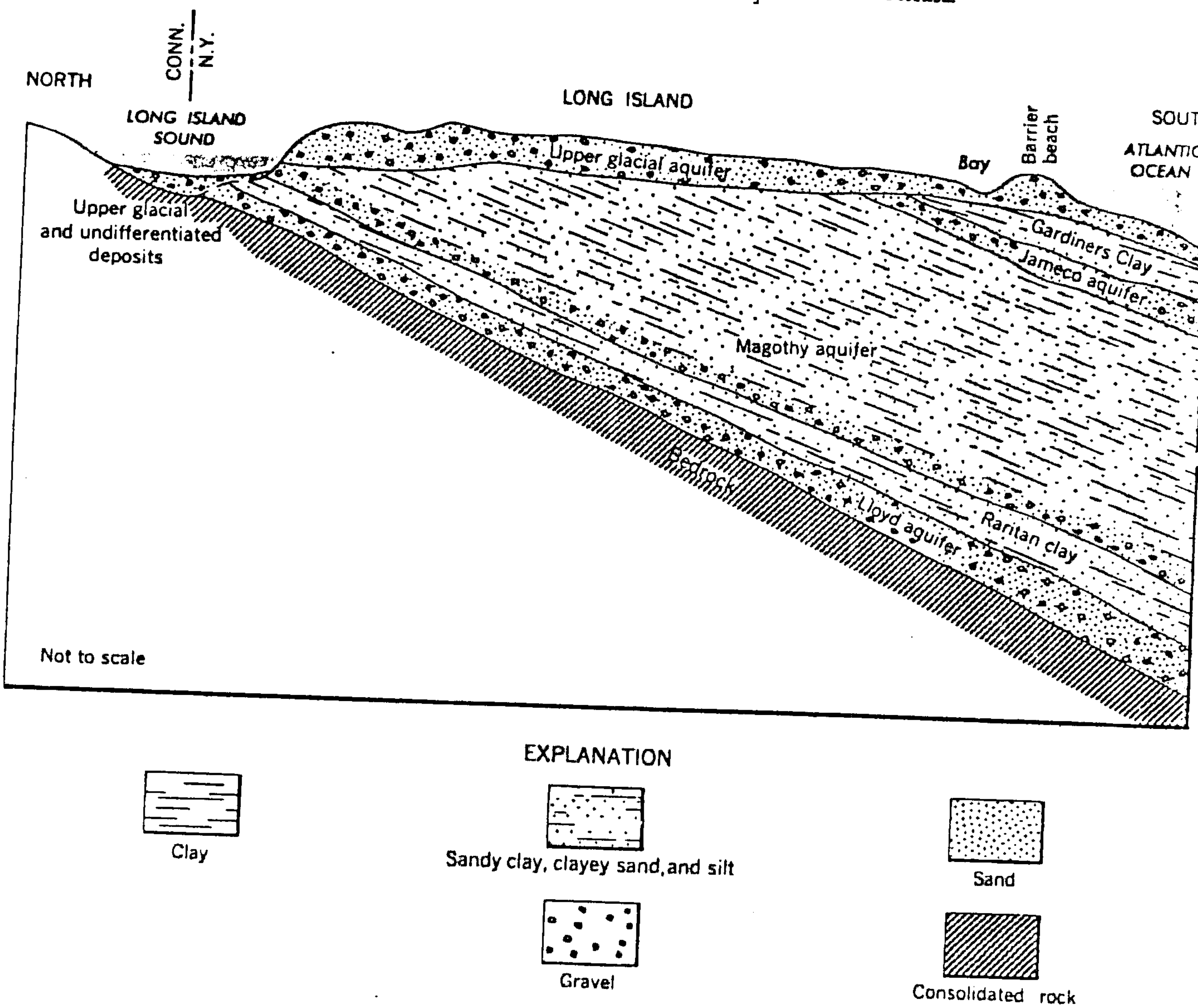


FIGURE 8.—Geologic features of the ground-water reservoir.

(FRANKE + McClymonds)

streams and glaciers so that the Pleistocene deposits lie on an irregular Cretaceous surface, and in places the Pleistocene deposits fill valleys cut by preglacial and glacial streams. These valleys have been fairly well defined in Kings and Queens Counties and along the northern margin of the island eastward to the middle of Suffolk County. In eastern Suffolk County, however, data on the contact between the Pleistocene and the Cretaceous are very sparse.

The upper surface of the Cretaceous deposits is above sea level in a large area in northern Nassau and western Suffolk Counties, and in all but a few small areas, the Pleistocene deposits cover the Cretaceous deposits throughout Long Island. Pertinent information concerning the principal hydrogeologic units within the ground-water reservoir are briefly summarized in table 2.

Ground water in the uppermost part of the zone of saturation on Long Island (mainly in the upper glacial aquifer, but locally also in the Magothy aquifer) is generally under water-table conditions. Artesian conditions predominate in most of the other parts of the ground-water reservoir of Long Island, where the saturated deposits are overlain and confined by silty and clayey layers of low hydraulic conductivity. The hydraulic head in the confined aquifers ranges from several feet below the water table to nearly 20 feet above it. At places along the north and south shores and on the barrier beaches, the head in the Lloyd aquifer is high enough to cause some wells which penetrate this aquifer to flow.

In addition to the Raritan clay, which confines water in the Lloyd aquifer, the other major well-defined confining layer in the ground-water reservoir is the Gardiners Clay. This unit locally confines water in the Jameco and Magothy aquifers. Numerous clayey and silty layers in the Magothy aquifer and clay beds in the glacial deposits also are significant confining layers. Normally, the degree of confinement in the Magothy aquifer increases with depth as more and more clayey layers intervene between the deep zone and the water table.

BOUNDARIES OF THE FRESH GROUND-WATER RESERVOIR

The boundaries of the fresh ground-water reservoir are the water table, the fresh-salt water interface, and the bedrock surface. The estimated average position of the water table under natural conditions is shown in figure 9. The position of the contours is based on a map of the water table in Kings, Queens, and Nassau Counties in 1903 (prepared by Veatch in 1906), and on later water-table maps of Suffolk County. Major features of this map are the two areas of highest ground-water altitude (represented by closed 80-ft and 60-ft contours) which extend approximately westward in the north-central parts of Nassau and Suffolk Counties. Also noteworthy are the steep water-level gradients near the north shore of Long Island compared to the gradients near the south shore.

The water table, which is the upper boundary of the ground-water reservoir, is a dynamic (moveable) feature. Present information indicates that recharge to the water table occurs throughout virtually all of Long Island. Therefore, the water table is not, from the point of view of potential theory, a stream surface. It is instead a surface characterized by a constantly varying potential which is equal to the altitude of the water table at any point. Because the water table on Long Island is largely a recharging potential boundary of the ground-water reservior, streamlines flow perpendicularly from the water table into the ground-water reservoir. Locally, as near the shorelines where ground water is lost by evapotranspiration, the water table is a discharging potential boundary.

The ground-water reservoir is bordered laterally by a second moveable boundary—the fresh salt water interface. The position of this interface (or these interfaces) is fairly accurately known only in southwestern Nassau and southeastern Queens Counties as a result of an intensive investigation by Lusczynski and Swarzenski (1966). A north-south cross section through the ground-water reservoir in this area (fig. 10) shows three separate salt-water wedges—a shallow wedge in the glacial aquifer and intermediate and deep wedges in the Magothy aquifer. Furthermore, a fourth wedge exists in the Lloyd aquifer somewhere seaward of the barrier beaches.

The occurrence of fresh ground water in the Lloyd aquifer below salty ground water in the lower part of the Magothy aquifer has never been adequately explained. However, this occurrence must be related in some way to the relatively impermeable Raritan clay overlying the Lloyd aquifer. At least four separate wedges of salty ground water with relative positions approximately as indicated in figure 10 probably occur for a considerable distance eastward from western Nassau County (on the order of tens of miles) along the south shore of Long Island.

Very scanty information indicates that the Lloyd aquifer and the deep Magothy aquifer contain salty ground water beneath the Forks of Long Island. The fresh ground water beneath the Forks occurs in a lens ranging in thickness from a few feet to several hundred feet.

(Franke + McClymonds)

Shucaak, 1975
and Schafer (8 pages)

July 31, 1975

Mr. William Landman
Commissioner of Sanitation
Town of Hempstead
Town Hall
Hempstead, New York

Re: Process Water Discharge Merrick Incinerator

Dear Commissioner Landman:

The following is a summary of the water quality samples collected from January 28,1975 through July 8, 1975:

PARAMETER	AVERAGE INFLUENT (mg/l)	AVERAGE EFFLUENT (mg/l)	ADJUSTED EFFLUENT (mg/l)	E.P.A. STANDARD	ACCEPTABLE
BOD	3	21	18	30	YES
pH	7.1	7.3	7.3	6.5 - 8.5	YES
Sus.Solids	24	145	121	30	NO
Chlorides	3,320	5,300	-	-	-
COD	43.9	252.6	208.7	-	-
Fe	0.89	0.93	0.04	0.5	YES
Cu	0.09	0.38	0.29	0.2	NO
Zn	0.26	3.28	3.02	0.5	NO
Pb	0.02	0.27	0.25	0.05	NO
Cd	0.005	0.13	0.12	0.1	NO
Ni	0.05	0.10	0.05	1.0	YES
Cr+6	0.01	0.01	0.00	0.05	YES
Total Hardness	630	1,550	920	-	-
Total Alk.	37	97	60	-	-
Sulphates	378	463	85	-	-
Nitrates	1.1	1.1	0	-	-
Nitrites	0.003	0.003	0	-	-
Fecal Coli MPN/100 ml.	140	4,500	4,360	200	NO
Total Coli MPN/100 ml	1,750	37,000	35,250	700	NO

Mr. William Landman -2- July 31,1975
Commissioner of Sanitation

Your attention is directed to all those parameters which are not acceptable in accordance with EPA effluent limitations. It is recommended that a consulting engineer be retained to conduct a feasibility study of the type of treatment needed to bring the effluent concentrations within acceptable limits.

The immediate installation of a chlorinator to reduce the coliform levels is strongly recommended.

Please do not hesitate to call if you have any questions or need additional information concerning the sampling results.

Very truly yours,

Stanley Juczak, Jr.
Director
Bureau Land Resources Management

SJ:tp

File
Town
Comm

February 25, 1975

Mr. Thomas Martha
C.R. Valmy
220 Mineola Boulevard
Mineola, New York

Re: Merrick Wastewater

Dear Tom:

The following are the results of the laboratory analyses for our samples collected in January 28, 1975.

Lead	-	1.0	mg/l
Copper	-	0.12	mg/l
Zinc	-	3.4	mg/l
Cadmium	-	0.22	
pH	-	7.0	
Suspended Solids	-	24.	
Chlorides	-	3700.0	mg/l
Total Coliform	-	240,000	MPN/100 ml
Fecal Coliform	-	24,000.0	MPN/100 ml

Some discrepancy is noted for zinc, chlorides and coliforms. We will retest in the near future.

Very truly yours,

Stanley Juczak, Jr.
Director
Bureau Land Resources Mangement

SJ:tp

MEMORANDUM

NASSAU COUNTY DEPARTMENT OF HEALTH

240 Old Country Road — Mineola, New York 11501

To : Mr. Stanley Juczak, Jr. — Date: July 29, 1975

From : Howard Schaefer

Subject : Merrick sampling results

The following is a summary of average sampling results at the Merrick Incinerator from January 28, 1975 through July 8, 1975. Coliforms are log averages.

	S-1 High	S-1 Low	S-1 Mean	S-2 High	S-2 Low	S-2 Mean	
BOD	7	2	3	52	9	21	30
pH	7.5	6.7	7.1	7.9	6.4	7.3	6.5-8.5 7 SAMPLES
Susp. Solids	56	8	24	907	13	145	30
Chlorides	13,200	620	3,320	8,200	1,260	5,300	
COD	60	27.7	43.9	268.0	237.1	252.6	EVALUATE INDIVID.
Fe	0.92	0.86	0.89	1.19	0.46	0.93	0.5 + 1
Cu	0.17	0.05	0.09	0.88	0.11	0.38	0.2 + 1
Zn	0.31	0.20	0.26	4.2	1.65	3.28	0.5 + 1
Pb	0.02	0.02	0.02	0.71	0.02	0.27	0.05 + 1
Cd	0.005	0.005	0.005	0.21	0.04	0.13	0.13 SAMPLES
Ni	0.05	0.05	0.05	0.11	0.08	0.10	1.0 + 1
Cr+6	0.01	0.01	0.01	0.01	0.01	0.01	0.05
Total Hardness	1,240	240	630	2,560	420	1,550	
Alkalinity	44	32	37	118	81	97	
Sulphates	922	83	378	696	136	463	
Nitrates			1.1			1.1	
Nitrites			0.003			0.003	
Fecal Coli	9,300	23	140	2.4x106	93	4,500	200
Total Coli	9,300	430	1,750	2.4x106	93	37,000	400 SAMPLES

HD54-5/69 M 779-7-70

MEMORANDUM

NASSAU COUNTY DEPARTMENT OF HEALTH

240 Old Country Road - Mineola, New York 11501

To : Stanley Juczak, Jr. Date: April 28,1987

From : Howard Schaefer

Subject : Merrick Water Sapples

Three samples taken from the Merrick incinerator have been tested for additional constituents with the following results:

	2/25/75		3/25/75		4/10/75		AVERAGE	
	INLET	OUTFALL	INLET	OUTFALL	INLET	OUTFALL	INLET	OUTFALL
BOD	2	52	2	25	1	9	2	29
COD	60.0	268.0	27.7	237.1	N/A	N/A	43.9	252.6
SS	23	44	10	256	56	19	30	106
FE	0.86	1.19	0.92	1.14	0.90	0.46	0.89	0.93
NH_3	0.67	0.18	N/A	N/A	N/A	N/A	0.67	0.18
NO_2	0.003	<0.001	N/A	N/A	N/A	N/A	0.003	<0.001
NO_3	1.10	0.19	N/A	N/A	N/A	N/ A	1.10	0.19
Cl	840	1260	620.	5000	1260 /	8200	907	4820
Total Hardness	1240	420	240	1680	416	2560	632	1553
Total Alk	32	118	44	92	36	81	37	97
pH	7.1	6.4	7.0	7.1	6.9	7.3	7.0	6.9
Cr +6	<0.01	<0.01	<0.01	<0.01	N/A	N/A	<0.01	<0.01
Cu	<0.05	0.88	<0.05	0.11	0.17	0.16	.09	0.38
Zn	0.20	1.65	0.28	4.20	0.31	4.0	0.26	3.28
Pb	0.02	0.08	0.02	<0.02	0.02	0.71	0.02	0.27C
Cl	<0.005	0.040	<0.005	0.14	N/A	0.21	0.005	0.13
SO_4	128	556	83	696	922	136	378	463
Ni	0.05	0.08	<0.05	0.11	N/A	N/A	<0.05	0.10
Total Coli	4300	240,000	9300	46000	750	4300	3100	36,200
Fecal Coli	930	93,000	1500	9300	23	4300	320	15,500

Coliform averages are log averages.

Howard Schaefer

Howard Schaefer

HS :tp

HD54 - 5/69 M 779 - 7-70

MERRICK INCINERATOR - ASH POND EFFLUENT - FIELD CONDITIONS

DATE	TEMPERATURE RANGE	DEPTH OVER 90 V-NOTCH WEIR	REMARKS
1/28/75	7 - 9°C	6 - 6.5 inches	Slight floating ash at 1:00-1:15PM Cty. Health Inspector took grab sample at 1:20 PM.
1/29/75	9.5 - 10.5°C	6.25 - 7.0 in.	Some floting ash at 11A-3P.
2/4/75	5 - 7°C	6.75 - 7.25 in	Floating ash in PM; very heavy during 1:30 - 2 PM.
2/14/75	3 - 6°C	6 - 6.5 in.	No floating ash.

DATE	Cr^{+6} mg/L	Fe mg/L	Ni mg/L	Zn mg/L	TS mg/L	SS mg/L	VSS mg/L	Sett. Solids ml/L	pH	Cl^- mg/L
1/28	<0.005	5.0	0.08	1.5	7252	25	12	0.05	7.7	4250
1/29	<0.005	2.3	0.10	1.8	8270	40	5	0.05	7.5	4875
2/4	<0.005	3.35	0.10	2.3	6717	148	24	0.1	7.1	4250
2/14					9673	20	6	0.0	7.1	5625

DATE	Cl_2 Demand mg/L	NH_3-N mg/L	NO_3-N mg/L	NO_2-N mg/L	TKN mg/L	$SO_4^=$ mg/L	BOD mg/L	T. Coliform #/ 100 ml	Fecal Coli. #/ 100 ml
1/28	2.4	1.96	0.20	0.08	3.36	640	24	41,200	4,660
1/29	1.4	0.80	0.18	0.04	1.64	760	33	27,000	3,330
2/4	2.0	1.68	0.25	0.08	3.02	490		25,500	9,700
2/14	1.5	1.4	0.27	0.10	3.08	540		1,500	510

7 SAMPLES / 6 SAMPLES / 5 SAMPLES

	S-4W			S-4E			S-6W		
	High	Low	Mean	High	Low	Mean	High	Low	Mean
	54	2	14		2	27	17	2	5
	9.3	7.3	7.9		7.5	8.2	8.7	7.6	7
Susp.Solids	80	9	32		5	41	186	61	125
Chlorides	8,000	340	3,200	2,400	580	1,350	14,000	2,760	8,150
Cr	-	-	-	-	-	-	-	-	-
Fe	-	-	-	-	-	-	-	-	-
Cu	-	-	-	-	-	-	-	-	-
Zn	-	-	-	-	-	-	-	-	-
Pb	-	-	-	-	-	-	-	-	-
Cd	-	-	-	-	-	-	-	-	-
Ni	-	-	-	-	-	-	-	-	-
Cr+6	-	-	-	-	-	-	-	-	-
Total Hardness	-	-	-	-	-	-	-	-	-
Total ALKALINITY	-	-	-	-	-	-	-	-	-
Sulphates	-	-	-	-	-	-	-	-	-
Nitrate	-	-	-	-	-	-	-	-	-
Nitrite	-	-	-	-	-	-	-	-	-
Fecal Coli	$2.4x10^6$	20	13,200	460,000	430	19,400	24,000	15	780
Total Coli	$2.4x10^6$	35	16,500	460,000	430	31,800	43,000	93	3,300

S-6E

6 SAMPLES

BOD	5	1	3
pH	8.5	6.9	7.9
Susp.Solids	1,217	48	353
Chlorides	14,600	2,720	7,450
Fecal Coli	4,300	9.1	300
Total Coli	9,300	430	2,500

S-1 - Inlet - PUMP HOUSE
S- - Outfall - WEST END OF THIRD SETTLING LAGOON
S-4W - West sump
S-4E - East sump
S-6W - West sluice
S-6E - East sluice

Due to difficulty in obtaining a sample the electrostatic precipitator sluice water was sampled once on June 3, 1975.

BOD	9
pH	9.5
Susp.Solids	2,626
Chlorides	740
Fecal Coli	N/A
Total Coli	N/A
Total Solids	4,576

HS:tp
2/

1

N_W YORK STATE DEPARTMENT OF .EALTH
DIVISION OF LABORATORIES AND RESEARCH
ENVIRONMENTAL HEALTH CENTER

89
File
TOH - Sand. Rd.
#1 & 2 Merrick

RESULTS OF EXAMINATION
(PAGE 1 OF 1)

LAB ACCESSION NO: 00527 YR/MO/DAY/HR SAMPLE REC'D: 75/10/17/11

REPORTING LAB: 52 CENTRAL AVE, LAB
PROGRAM: 520 INDUSTRIAL WASTES
STATION (SOURCE) NO:
DRAINAGE BASIN: 17 NY GAZETTEER NO: 2950 COUNTY: NASSAU
COORDINATES: DEG ' "N, DEG ' "W
COMMON NAME INCL SUBW'SHED: MERRICK INCINERATOR GROUNDWATER, MERRICK

EXACT SAMPLING POINT: PROCESS WATER DISCHARGE
TYPE OF SAMPLE: 39 MISC, LIQ, WASTE
MO/DAY/HR OF SAMPLING: FROM 00/00 TO 10/16/14
REPORT SENT TO: CO (1) RO (2) LPHE (1) LHO (0) FED (0) CHEM (1)

PARAMETER		UNIT	RESULT	NOTATION
038009	O P.C.B., AROCLOR 1016/1242	MCG/L	0.25	LT
038109	O P.C.B., AROCLOR 1254	MCG/L	0.25	LT
015309	Z P.C.B. TOTAL	MCG/L	0.25	LT
034300	O P.C.B. UNIDENTIFIED		0.25	LT

DATE COMPLETED: 1/16/76

ASST. COMMR. FOR ENVIRONMENTAL HEALTH
NASSAU COUNTY HEALTH DEPT.
240 OLD COUNTRY ROAD
MINEOLA NEW YORK 11501

Copies:

Facility ID No. : NY 000 7498

Effective Date : EDP

Expiration Date : EDP & 5 years

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM (SPDES)
DISCHARGE PERMIT

Special Conditions
(Part I)

DRAFT, 12/17/79

This SPDES permit is issued in compliance with Title 8 of Article 17 of the Environmental Conservation Law of New York State and in compliance with the provisions of the Federal Water Pollution Control Act, as amended by the Federal Water Pollution Control Act Amendments of 1972, P.L. 92-500, October 18, 1972, (33 U.S.C. §1251 et. seq.) (hereinafter referred to as "the Act").

Department of Sanitation
Town of Hempstead
1600 Merrick Road
Merrick, New York 11556

is authorized to discharge from the facility described below:

Merrick Incinerator Complex
Merrick, Nassau County

into receiving waters known as:

East Bay Class SA

in accordance with the effluent limitations, monitoring requirements and other conditions set forth in this permit.

This permit and the authorization to discharge shall expire on midnight of the expiration date shown above and the permittee shall not discharge after the expiration date unless this permit has been renewed, or written authorization is given by the Department. In order to receive authorization to discharge beyond the expiration date, the permittee shall submit such information, forms, and fees as are required by the Department of Environmental Conservation no later than 180 days prior to the expiration date.

By Authority of ______________________________

Designated Representative of Commissioner of the
Department of Environmental Conservation

______________________ ______________________
Date Signature

Final EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning EDP and lasting until EDP + 5 years the discharges from the permitted facility shall be limited and monitored by the permittee as specified below:

	(3)	Discharge Limitations				Monitoring Reqmts.	
Outfall	Effluent	kg/day (lbs/day)		Other Units (Specify)		Measurement	Sample
Number	Parameter	Daily Avg.	Daily Max.	Daily Avg.	Daily Max.	Frequency	Type
001	Process Flow - Incinerator process water, contaminated storm run off, leachate from on-site landfill.						
	Flow					Continuous	
	BOD_5				5 mg/l	2/mo	6-hr.comp.
	COD				150 mg/l	"	"
	Suspended Solids				10 "	"	grab
	Settleable Solids				0.1 "	"	"
	Dissolved Oxygen (7.0 mg/l minimum)					"	"
	Coliforms			2400/100 ml	5000/100 ml	"	"
	Fecal Coliforms			200/100 ml	400/100 ml	"	"
	Ammonia				2.0 mg/l	"	6-hr.comp.
	Aluminum			2.0 mg/l	4.0 mg/l	"	"
	Barium			2.0 "	4.0 "	"	"
	Cadmium			0.2 "	0.4 "	"	"
	Chlorine, Residual				0.05 "	"	grab
	Copper			0.4 mg/l	0.8 mg/l	"	"
	Cyanide, Complex $Fe(CN)_6$			0.8 "	1.6 "	"	"
	Fluoride			3.0 "	6.0 "	"	"
	Iron			2.0 "	4.0 "	"	"
	Lead			0.1 "	0.2 "	"	"
	Mercury			0.1 "	0.2 "	"	"
	Manganese			2.0 "	4.0 "	"	"
	Nitrogen Kjeldahl (4)			Monitor only		"	"
	Oil & Grease			10 mg/l	15.0 mg/l	"	"

NOTE: No biocides, slimicides or corrosion control chemicals are authorized under this permit. If such additives are used, then approval by the Nassau County Health Department and the New York State Department of Environmental Conservation is required, prior to use.

The pH shall not be less than 6.5 standard units nor greater than 8.5 standard units and shall be monitored as follows: daily grab for outfalls 001 & 003

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s):

The daily average discharge is the total discharge by weight or in other appropriate units as specified herein, during a calendar month divided by the number of days in the month that the production or commercial facility was operating. Where less than daily sampling is required by this permit, the daily average discharge shall be determined by the summation of all the measured daily discharges in appropriate units as specified herein divided by the number of days during the calendar month when the measurements were made.

The daily maximum discharge means the total discharge by weight or in other appropriate units as specified herein, during any calendar day.

Final EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning EDP and lasting until EDP + 5 years the discharges from the permitted facility shall be limited and monitored by the permittee as specified below:

Outfall Number	(3) Effluent Parameter	Discharge Limitations kg/day (lbs/day) Daily Avg.	Daily Max.	Other Units (Specify) Daily Avg.	Daily Max.	Monitoring Reqmts. Measurement Frequency	Sample Type
001	Process Flow Continued						
	Phenol			1.0 mg/l	2.0 mg/l	2/mo	grab
	Zinc			0.6 "	1.2 "	"	"
	PCB (4)			Monitor Only		"	"
	Chlorinated Hydrocarbon (4)			Monitor Only		"	"
	Temperature				90^oF	2/mo	grab
002	Sanitary Flow - To municipal sewage treatment plant						
003	Cooling Water Flow - non contact						
	Flow					Continuous	
	Temperature				90^oF	2/mo	grab

NOTE: (4) Based upon monitoring data submitted and/or the development of water quality criteria for this parameter, final effluent limitations may be established, along with a schedule of compliance to achieve the same, if needed.

The pH shall not be less than 6.5 standard units nor greater than 8.5 standard units and shall be monitored as follows: daily grab for outfalls 001 & 003

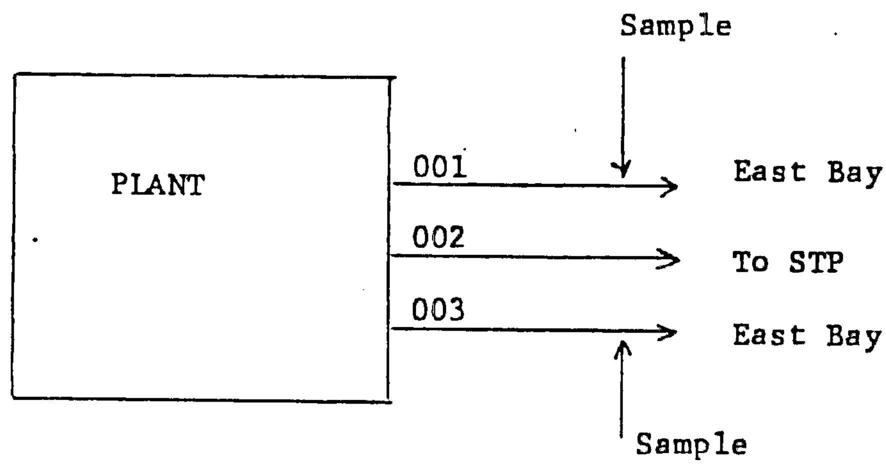
Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): Samples shall be taken after chlorination

The daily average discharge is the total discharge by weight or in other appropriate units as specified herein, during a calendar month divided by the number of days in the month that the production or commercial facility was operating. Where less than daily sampling is required by this permit, the daily average discharge shall be determined by the summation of all the measured daily discharges in appropriate units as specified herein divided by the number of days during the calendar month when the measurements were made.

The daily maximum discharge means the total discharge by weight or in other appropriate units as specified herein, during any calendar day.

Monitoring Locations

Permittee shall take samples and measurements to meet the monitoring requirements at the location(s) indicated below: (Show locations of outfalls with sketch or flow diagram as appropriate).



MONITORING, RECORDING AND REPORTING

a) The permittee shall also refer to the General Conditions (Part II) of this permit for additional information concerning monitoring and reporting requirements and conditions.

b) The monitoring information required by this permit shall be summarized and reported by submitting a completed and signed Discharge Monitoring Report form once every 6 months to the Department of Environmental Conservation and other appropriate regulatory agencies at the offices specified below. The first report will be due no later than . Thereafter, reports shall be submitted no later than the 28th of the following month(s):

Chief, Waste Source Monitoring Section
New York State Department of Environmental Conservation
Room 300 - 50 Wolf Road - Albany, New York 12233

Regional Engineer
New York State Department of Environmental Conservation
Regional Office #1, Bldg. 40 - SUNY, Stony Brook, New York 11794

Nassau County Health Dept., 240 Old Country Road, Mineola, N.Y. 11501

Dr. Richard Baker, Chief, Permits Administration Branch
Planning & Management Division, USEPA Region II, 26 Federal Plaza, NY, NY 10007

Interstate Sanitation Commission
10 Columbus Circle, New York, New York 10019

c) If so directed by this permit or by previous request, Monthly Wastewater Treatment Plant Operator's Reports shall be submitted to the DEC Regional Office and county health department or county environmental control agency specified above.

d) Each submitted Discharge Monitoring Report shall be signed as follows:

1. If submitted by a corporation, by a principal executive officer of at least the level of vice president, or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge described in the Discharge Monitoring Report originates;

2. If submitted by a partnership, by a general partner;

3. If submitted by a sole proprietor, by the proprietor;

4. If submitted by a municipality, State or Federal agency, or other public entity; by a principal executive officer, ranking elected official, commanding officer, or other duly authorized employee.

e) Unless otherwise specified, all information submitted on the Discharge Monitoring Form shall be based upon measurements and sampling carried out during the most recently completed reporting period.

f) Blank Discharge Monitoring Report Forms are available at the above addresses.

Region 1

HYDROGEOLOGIC CONDITIONS

MERRICK AND OCEANSIDE

SOLID WASTE DISPOSAL SITES

TOWN OF HEMPSTEAD, NEW YORK

Nov. 1981

GERAGHTY
& MILLER, INC.

Consulting Ground-Water Geologists and Hydrologists

NORTH SHORE ATRIUM
6800 JERICHO TURNPIKE
SYOSSET, NEW YORK 11791

HYDROGEOLOGIC CONDITIONS
MERRICK AND OCEANSIDE
SOLID WASTE DISPOSAL SITES
TOWN OF HEMPSTEAD, NEW YORK

INTRODUCTION

Geraghty & Miller, Inc. was retained by Charles R. Velzy Associates, Inc. to review hydrogeologic information and determine the need for ground-water monitoring at the Town of Hempstead's solid waste disposal sites.

The sites are located in the Town of Hempstead on the south shore of Nassau County, New York. The two sites, one at Merrick and the other at Oceanside, have nearly identical hydrogeologic characteristics and therefore, the conclusions reached during this study are applied to them collectively.

REGIONAL GEOLOGY

Detailed descriptions of formations present beneath southern Nassau County can be found in the report of Perlmutter and Geraghty (1963)[1]. Summary descriptions of five unconsolidated units pertinent to this study are given below and illustrated in Figure 1. Geologic logs of selected wells are included in the Appendix of this report.

The Upper Pleistocene deposits consist generally of glacial outwash materials and the "20-foot" clay. Highly permeable outwash deposits of fine to coarse sand and gravel are exposed at the surface and extend to depths between 45 feet and 65 feet. Beneath this outwash is a relatively thin bed of marine clay ("20-foot" clay) which forms a barrier between unconfined salty water above and confined fresh water below.

1) Geology and Ground-Water Conditions in Southern Nassau and Southeastern Queens Counties, Long Island, New York. Geological Survey Water-Supply Paper 1613-A.

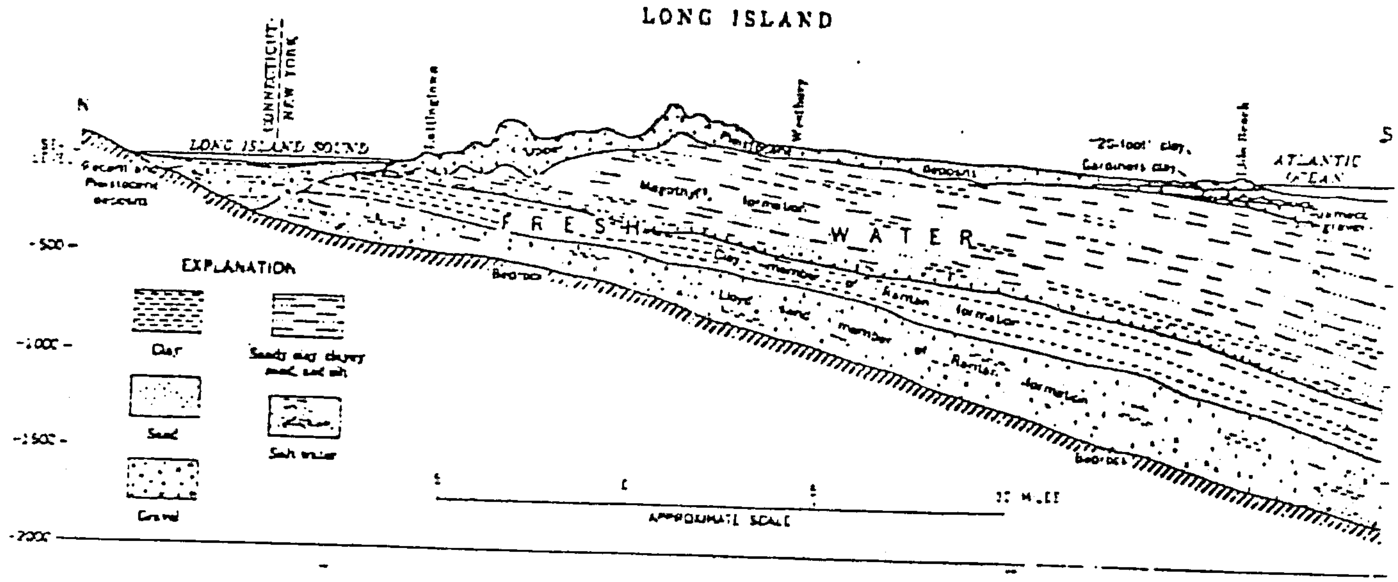
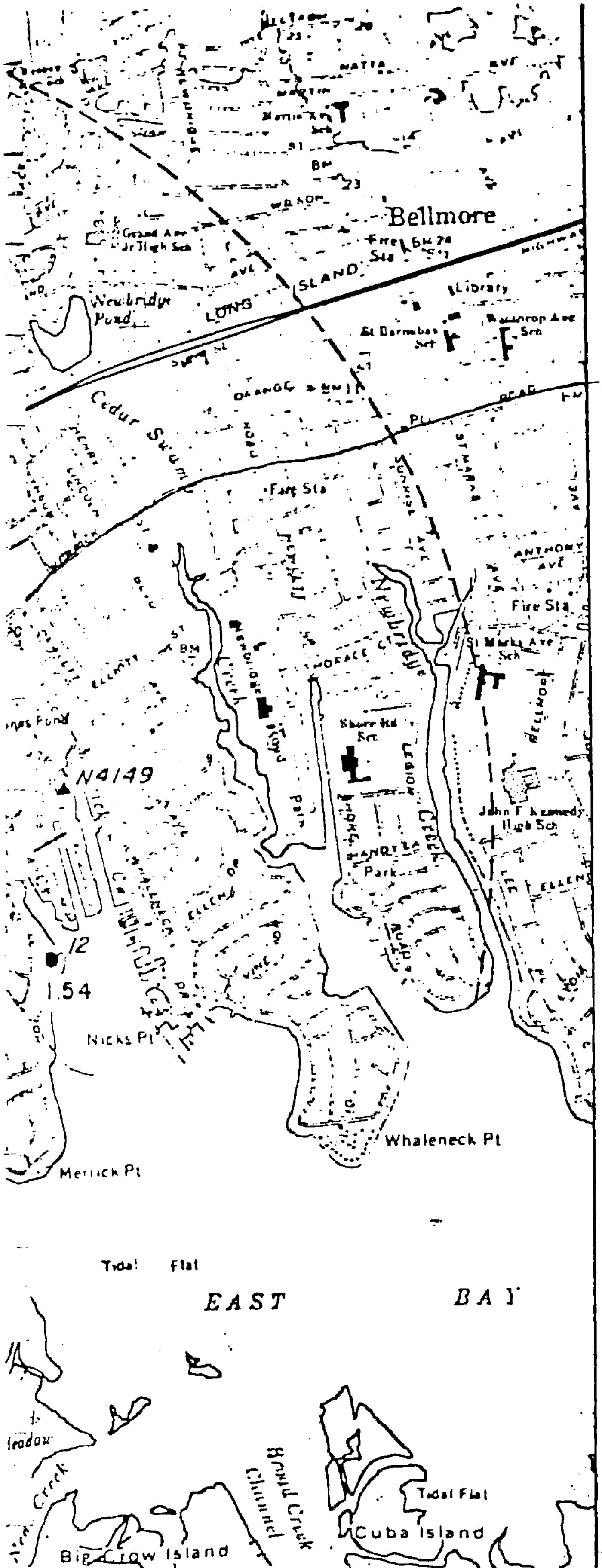


Figure 1. Generalized section showing stratigraphic units in central Nassau County, N.Y. (from Perlmutter and Geraghty, 1963).



EXPLANATION

Town of Hempstead Dept. of Sanitation Merrick Solid Waste Disposal Site.

9 / 7.61 — U.S.G.S. monitor well location number with elevation of water table, in feet above mean sea level.

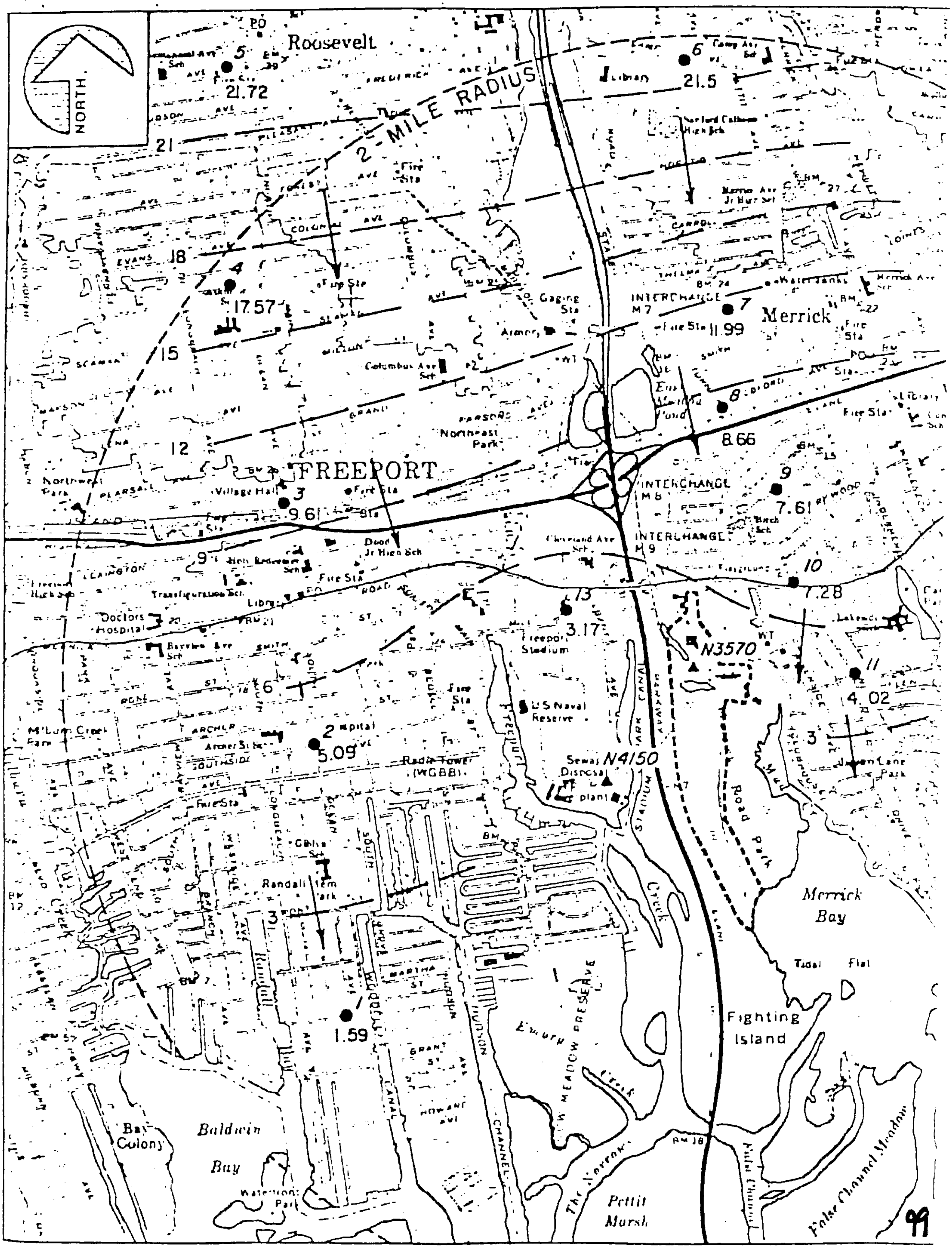
Water-table contour, in feet above sea level.

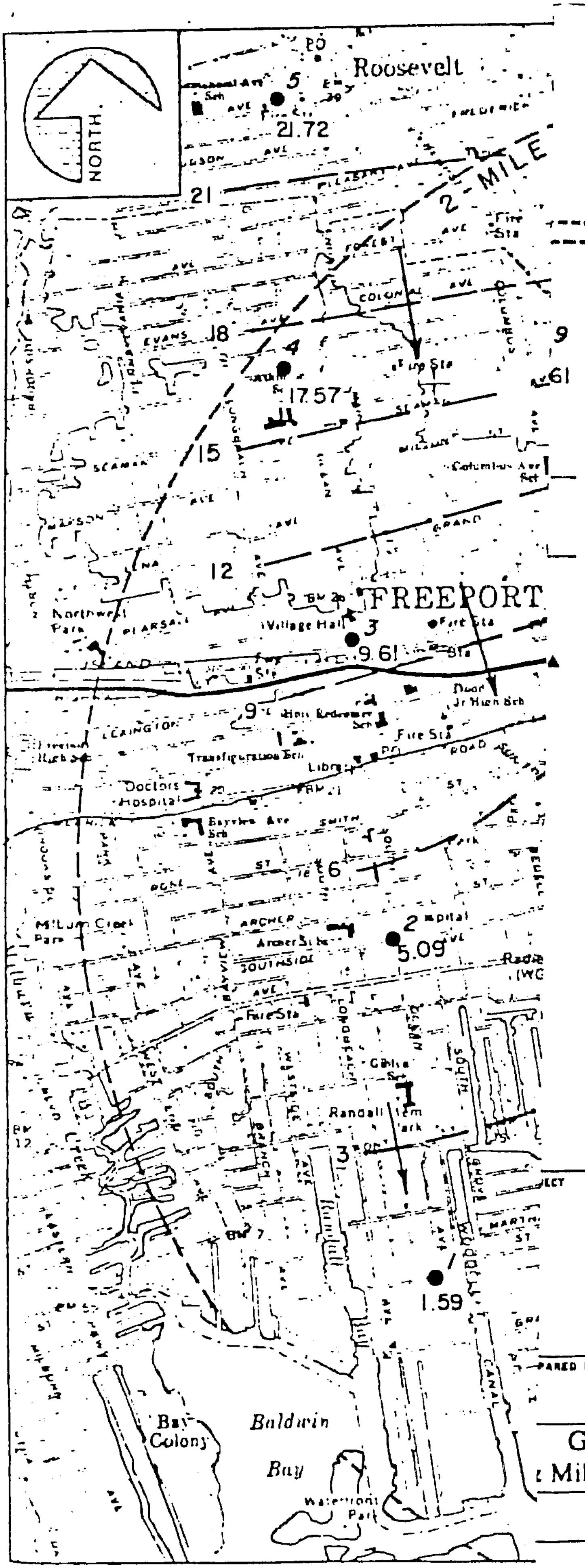
Approximate lateral direction of ground-water flow.

Well location for which log is available

0 1/2 1 mile

SUBJECT: WATER-LEVEL ELEVATIONS FOR THE MERRICK, FREEPORT AREA MAY 27, 28 & JUNE 3, 1980			
PREPARED FOR: CHARLES R. VELZY, ASSOCIATES, INC.			
Geraghty & Miller, Inc.	COMPILED BY BRUCE CARPENTER; PREPARED BY; PROJECT MGR. DOUG MAC CALLUM	SCALE 1"=2000'; DATE JUNE 1981	FIGURE 2


NORTH
Roosevelt
2-MILE RADIUS
21.72
21.5
17.57
FREEPORT
Merrick
INTERCHANGE M 7
INTERCHANGE M 8
INTERCHANGE M 9
11.99
8.66
9.61
7.61
7.28
3.17
4.02
5.09
1.59
N3570
N4150
Northeast Park
Northwest Park
Village Hall
Doctors Hospital
Freeport Stadium
U.S. Naval Reserve
Radio Tower (WGBB)
Armory
Columbus Ave Sch
Randall Park
Merrick Bay
Tidal Flat
Fighting Island
Baldwin Bay
Bay Colony
Waterfront Park
Pettit Marsh
The Narrows
False Channel Meadow
Road Park



EXPLANATION

Town of Hempstead Dept. of Sanitation Merrick Solid Waste Disposal Site.

U.S.G.S. monitor well location number with elevation of water table, in feet above mean sea level.

Water-table contour, in feet above sea level.

Approximate lateral direction of ground-water flow.

Well location for which log is available

0 1/2 1 mile

WATER-LEVEL ELEVATIONS FOR THE MERRICK, FREEPORT AREA MAY 27,28 & JUNE 3, 1980

PREPARED FOR CHARLES R. VELZY, ASSOCIATES, INC.

Geraghty & Miller, Inc.	COMPILED BY BRUCE CARPENTER	SCALE 1"=2000'	FIGURE 2
	PREPARED BY	DATE JUNE 1981	
	PROJECT MGR. DOUG MAC CALLUM		

515-2

Present beneath the Pleistocene deposits near the western edge of the study area are the Gardiners clay and the Jameco gravel. The Jameco gravel, consisting primarily of coarse sand and gravel, is confined above by the low permeability Gardiners clay.

The Magothy (?) Formation, underlying all of these deposits and forming the principal confined freshwater aquifer for the area, contains alternating beds of mixtures of gravel, sand, silt and clay.

Merrick Site

The Merrick solid waste disposal site (see Figure 2) is situated on permeable sand and gravel outwash deposits approximately 40 feet thick. Beneath these deposits are about 18 feet of solid gray clay described earlier as the "20-foot" clay which confines the Magothy (?) formation immediately below it. Neither Gardiners clay nor Jameco gravel is present at this location.

The direction of lateral ground-water flow in the unconfined outwash deposits is shown in Figure 2. Thirteen U.S. Geological Survey monitoring wells are screened in this aquifer (see Table 1) and provided data used to contour the water table from which flow directions were derived.

It is probable that ground-water flow in the upper glacial outwash deposits has no significant vertical component. The presence of the "20-foot" clay retards flow between aquifers in either direction. Furthermore, data from the two cluster wells in the area (Wells 12 and 13) show that the vertical component of flow, however small, is upward rather than

Table. 1 . Observation Wells Monitored Quarterly by the U.S. Geological Survey in the Vicinity of the Merrick Landfill Site.

Location No.	U.S.G.S. Well No.	Total Depth	Date Installed	Diameter (inches)	Altitude of Measuring Point (feet above mean sea level)	Altitude of Water Level (feet above mean sea level)	Date of Measurement
1	1169	24.35	10/57	1¼	4.89	1.59	5/28/80
2	1168	27.88	8/37	1¼	13.74	5.09	5/28/80
3	1167	25.00	7/66	2	23.34	9.51	6/ 3/80
4	1166	27.44	8/37	1¼	28.89	17.57	6/ 3/80
5	1165	42.30	1/67	1¼	39.55	21.72	6/ 3/80
6	1184	31.10	7/69	1¼	32.30	21.51	5/27/80
7	1185	18.10	3/65	1¼	21.10	11.99	5/27/80
8	8847	26.40	4/72	1¼	15.63	8.66	5/27/80
9	1269	14.24	-	1¼	12.76	7.61	5/28/80
10	1186	23.40	8/60	1¼	10.11	7.28	5/28/80
11	1271	14.33	8/40	1¼	5.95	4.02	5/28/80
12	8648	28.45	3/70	1¼	8.67	1.54	5/28/80
12	8831*	97.40	12/71	4	8.42	5.02	5/28/80
13	8203	16.20	1/62	1¼	6.50	3.17	5/28/80
13	8204*	55.50	10/76	2	6.50	4.44	5/28/80

Note: All observation wells screened in unconfined glacial aquifer except where noted.

* confined water level from deep aquifer.

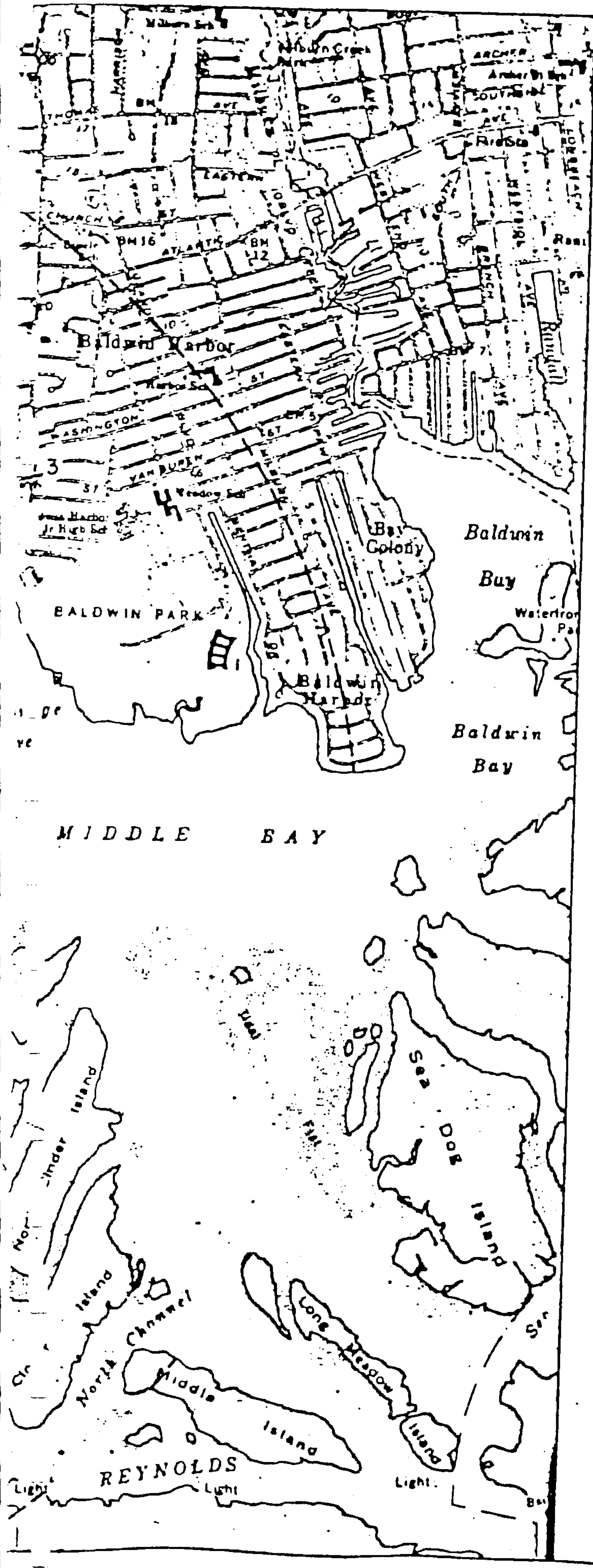
downward. As noted in Table 1, water levels (heads) in both cases are higher in wells tapping the confined aquifer than they are in wells tapping the shallow glacial aquifer.

Within two miles of the site, twelve public supply wells are in operation at five locations, all north of Sunrise Highway. Each of these wells is over 500 feet deep and pumps from the deep confined aquifer (Magothy (?) formation). NYSDEC policy does not allow public supply wells to be located south of Sunrise Highway (on the mainland).

Oceanside Site

Approximately 50 feet of permeable sand and gravel deposits are present beneath this site (see Figure 3). The "20-foot" clay is 10 to 12 feet thick below these outwash deposits and acts as a confining bed for the deeper Magothy (?) formation. This clay also restricts vertical flow between the two aquifers. Gardiners clay is not present beneath the northern part of the site but may appear farther south.

Hydrogeologic conditions at the Oceanside site are similar to those at the Merrick site. Figure 3 shows the configuration of the water table in the area, and the approximate direction of ground-water flow in the upper glacial aquifer. Synoptic water levels for the shallow and deep wells of the two-well clusters (wells 1, 7, 8 and 9; Table 2) again show heads measured in wells tapping the Magothy (?) formation are greater than the heads in the unconfined glacial deposits. Again, the vertical component of ground water flow is upward rather than downward.



EXPLANATION

Town of Hempstead Dept. of Sanitation Oceanside Solid Waste Disposal Site.

Sanitary landfill area

4
7.90
U.S.G.S. monitour well location number with elevation of water level, in feet above mean sea level.

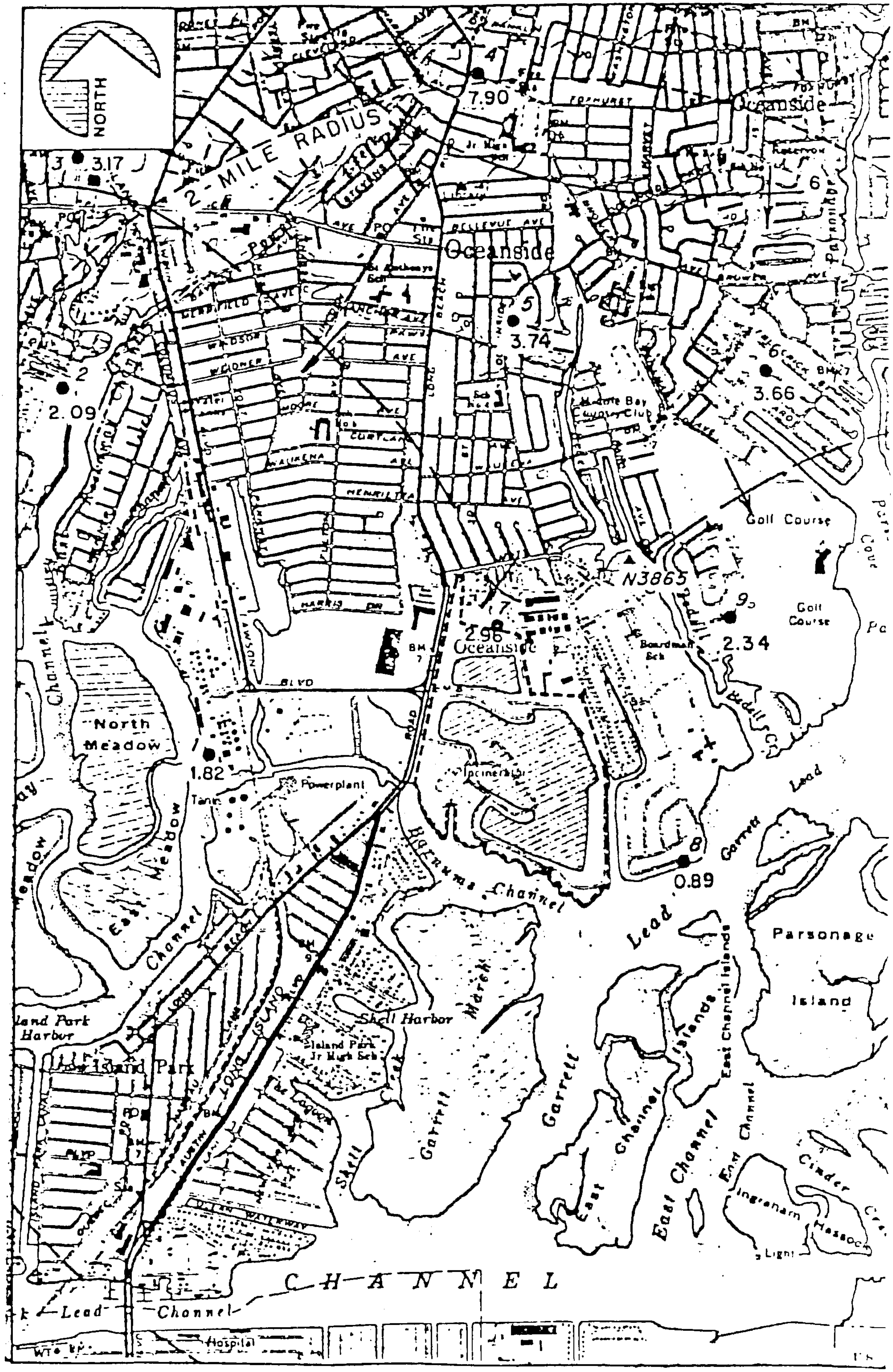
6 Water-table contour, in feet above mean sea level.

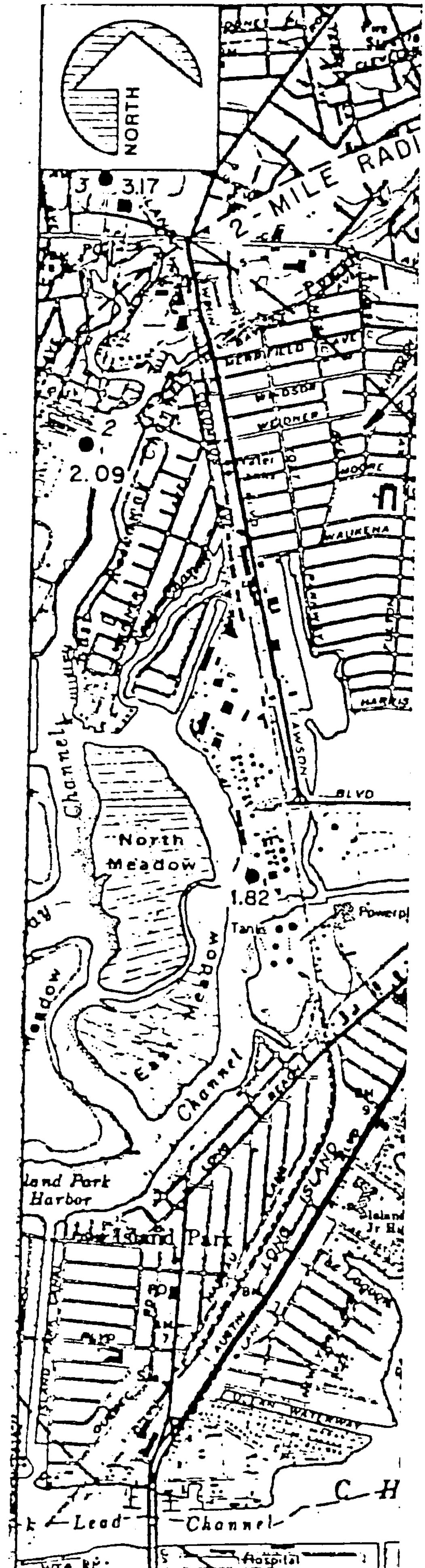
Approximate lateral direction of ground-water flow.

▲ Well location for which log is available

0 1/2 1 mile

SUBJECT				
WATER-LEVEL ELEVATIONS FOR THE OCEANSIDE AREA, MAY 29, 1980				
PREPARED FOR				
CHARLES R. VELZY, ASSOCIATES, INC.				
Geraghty & Miller, Inc.	COMPILED BY BRUCE CARPENTER	SCALE 1"=2000'	FIGURE	
	PREPARED BY		3	
	PROJECT MGR. DOUG MAC CALLUM	DATE JUNE 1981		


NORTH
2-MILE RADIUS
Oceanside
Oceanside
Oceanside
3.17
7.90
6
5
3.74
2
2.09
3.66
Middle Bay Country Club
Golf Course
Golf Course
N3865
7
2.96
9
2.34
Boardman Sch
North Meadow
1.82
Powerplant
Tank
Incinerator
Barnums Channel
8
0.89
Garrett Lead
Lead
Parsonage
Island
East Meadow Channel
Meadow
Channel
Shell Harbor
Island Park Harbor
Island Park
Island Park Jr High Sch
Marsh
Garrett
Garrett
Shell
East Channel Islands
East Channel
East Channel
Cinder
Ingraham Hassock
Light
Hospital
C H A N N E L
Lead
Channel


NORTH
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HARRIS
LAWSON
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Meadow
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Tanks
Powerpl
Meadow
Channel
Harbor
LONG ISLAND
Lead
Channel
Hospital
C H

Table 2. Observation Wells Monitored Quarterly by the U.S. Geological Survey in the Vicinity of the Oceanside Landfill Site.

Location No.	U.S.G.S. Well No.	Total Depth	Date Installed	Diameter (inches)	Altitude of Measuring Point (feet above mean sea level)	Altitude of Water Level (feet above mean sea level)	Date of Measurement
1	8763 1)	129.80	1/71	4	5.51	3.89	3/23/76 2)
1	8750	40.05	11/70	1¼	5.62	1.82	3/23/76 2)
2	8647	23.50	2/70	1¼	5.07	2.09	5/29/80
3	1133	23.85	6/59	1¼	9.57	3.17	5/29/80
4	1440	29.65	10/57	1¼	18.33	7.90	5/29/80
5	1441	23.10	1/62	1¼	10.69	3.74	5/29/80
6	8634	28.80	10/69	1¼	6.39	3.66	5/29/80
7	8637	33.35	10/69	1¼	4.98	2.96	5/29/80
7	8770 1)	141.20	3/71	4	4.89	3.57	5/29/80
8	8788	40.80	4/71	1¼	7.34	0.89	5/29/80
8	8849 1)	91.20	4/72	4	7.70	3.32	5/29/80
9	8806 1)	454.80	8/71	4	6.49	5.49	5/29/80
9	8635	28.50	10/69	1¼	7.26	2.34	5/29/80

Note: All observation wells screened in unconfined glacial aquifer except where noted.

1) Confined water level from deep aquifer.
2) Well abandoned in 1976.

... two miles south of Sunrise Highway. Thus, no public supply wells exist within a two-mile radius of the site.

FINDINGS AND CONCLUSIONS

1. Under present hydrogeologic conditions, leachate from the Merrick or Oceanside solid waste disposal sites cannot migrate to the deep confined aquifer (Magothy (?) formation). Two factors account for this. Geologic logs for wells in the area confirm the presence of the "20-foot" clay which ranges in thickness from 10 feet to about 25 feet. Furthermore, the head difference between the shallow unconfined aquifer and the deep confined aquifer indicates an upward component of flow.

2. The upper surface of the "20-foot" clay ranges from about 30 feet to nearly 70 feet below grade in the general area. It seems reasonable to assert that the bottom of each site is above the clay and that the clay has not been breached. Thus, a significant degree of protection is afforded.

3. Whether or not the present head difference between the two aquifers will prevail for an extended period of time is not known. However, changes are not likely to occur unless significant increases in pumpage take place.

4. The upper glacial aquifer is not for municipal water supplies. In fact, public supply wells are not permitted south of Sunrise Highway which is upgradient of the two sites. Therefore, it is impossible for either to affect municipal water supplies, and the installation of monitoring

wells for the purpose of detecting leachate migration is not necessary at this time.

Respectfully submitted,

GERAGHTY & MILLER, INC.

Nancy MacDermott
Hydrogeologist

Douglas R. MacCallum
Senior Scientist

APPENDIX

GEOLOGIC LOGS

Description	Thickness (feet)	Depth (feet below land surface)
N4149		
Recent Deposits:		
Fill	3	0 - 3
Bog	1	3 - 4
Upper Pleistocene Deposits:		
Sand, medium to very coarse, brown, and gravel.	34	4 - 38
Clay, solid, gray ("20 foot" clay)	11	38 - 49
Sand, fine to medium, clayey, gray and thin layers of gray solid clay.	14	49 - 63
Magothy (?) Formation:		
Sand, medium to coarse, gray, trace of gray clay, and lignite.	48	63 - 111
Sand, medium to coarse, gray and thin layers of gray solid clay.	10	111 - 121
Sand, fine to medium, clayey, gray, and thin layers of gray solid clay.	8	121 - 129
Sand, medium, gray.	51	129 - 180
Sand, fine to medium, gray, some thin layers of gray clay and lignite.	30	180 - 210
Clay, solid, gray.	10	210 - 220
Sand, fine to medium, gray, some coarse sand, and thin layers of gray solid clay.	14	220 - 234
Sand, fine to medium, gray, with some clay, and thin layers of gray solid clay.	24	234 - 258
Clay, solid, gray, some thin layers of gray fine to medium sand and silt.	10	258 - 268
Sand, fine to medium, gray, lignite.	10	268 - 278
Clay, sandy, gray.	4	278 - 282
Sand, fine to medium, gray, and lignite.	9	282 - 291

Description	Thickness (feet)	Depth (feet below land surface)
N4149 (cont'd.)		
Clay, solid, dark gray, with some thin layers of fine to medium clayey sand.	29	291 - 320
Sand, fine, gray, with some clay, and thin layers of lignite.	22	320 - 342
Clay, solid, black.	14	342 - 356
Sand, fine to medium, gray, with some clay, and thin lignite layers.	64	356 - 420
Sand, fine, gray, with some silt and gray clay, and thin lignite layers.	37	420 - 457
Clay, sandy, gray, layers of solid clay, fine silty sand, and lignite.	45	457 - 502
Sand, medium, gray, and thin lignite layers.	17	502 - 519
Sand, fine to medium, gray, with some clay, and thin lignite layers.	19	519 - 538
Clay, solid, gray.	5	538 - 543
Sand, medium,gray, some fine and coarse grains, and trace of gray clay.	25	543 - 568
Sand, fine to medium, gray, with trace of gray clay, and some thin layers of solid clay and lignite.	50	568 - 618
Sand, medium, gray, some fine and coarse grains, trace of clay and lignite.	38	618 - 656
Clay, solid, gray, with thin lignite layers	22	656 - 678
Sand, fine to medium, with some gray clay.	36	678 - 714
Sand, medium to coarse, gray and gravel mixed with some clay, and layers of gray solid clay.	22	714 - 736
Clay, sandy, gray, with thin layers of solid clay.	9	736 - 745
Sand, medium to coarse, gray, and gravel, with layers of gray solid clay and sandy clay.	24	745 - 769

GEOLOGIC LOGS

Description	Thickness (feet)	Depth (feet below land surface)
N4149 (cont'd.)		
Clay, solid and silty, gray, with some very fine sand.	11	769 - 780
Sand, fine to medium, gray, with some coarse grains, and trace of clay.	20	780 - 800
Raritan Formation:		
Clay, silty and solid, gray.	15	800 - 815
Clay, sandy, gray, with layers of fine to medium clayey sand and lignite.	41	815 - 856
Clay, solid and silty, gray, with lignite layers.	22	856 - 878
N3570		
Upper Pleistocene Deposits:		
Loam and gravel.	3	0 - 3
Sand, medium to coarse; grit.	8	3 - 11
Sand, coarse, brown; grit and gravel.	22	11 - 33
Sand, medium to coarse, white and gravel.	7	33 - 40
Clay, solid, gray ("20 foot" clay)	18	40 - 58
Magothy (?) Formation:		
Sand, gravel, clay.	7	58 - 65
Sand, dirty white; grit and some clay.	13	65 - 78
Sand, fine to medium; grit and mica.	20	78 - 98
Sand, fine; mica; layers of wood and clay.	22	98 - 120
Sand, medium to coarse; grit and lumps of clay.	2	120 - 122
Sand, fine, white; mica; white clay.	9	122 - 131
Sand, very fine, gray; mica; lumps of clay.	18	131 - 149
Sand, very fine, white; clay.	2	149 - 151

GEOLOGIC LOGS

Description	Thickness (feet)	Depth (feet below land surface)
N4150		
Fill.	3	0 - 3
Bog.	9	3 - 12
Pleistocene Deposits:		
Sand, coarse, brown, grit and gravel.	10	12 - 22
Sand, coarse, gray, grit, gravel, and lumps of clay.	14	22 - 36
Sand, very fine to fine, silty, gray-green; layers of gray-green silt and solid clay ("20 foot" clay).	15	36 - 51
Magothy (?) Formation:		
Sand, fine to coarse, gray layers of lignite; some thin layers of gray solid clay.	21	51 - 72
Sand, fine to medium, gray.	7	72 - 79
Sand, medium to coarse, gray, some thin layers of gray solid clay, and lignite.	31	79 - 110
Clay, solid, gray; layers of lignite and gray medium to coarse clayey sand.	6	110 - 116
Sand, medium to coarse, gray.	20	116 - 136
Sand, fine, clayey, gray; thin layers of lignite and gray medium sand.	15	136 - 151
Sand, fine to medium, gray; some clay.	18	151 - 169
Sand, medium to coarse, gray; layers of lignite.	8	169 - 177
Sand, fine to medium, gray; some clay; layers of lignite.	18	177 - 195
Clay, solid, gray; thin layers of gray, fine to medium sand and lignite.	13	195 - 208
Sand, fine to medium, gray; thin layers of gray clayey sand and lignite.	20	208 - 228
Sand, fine to medium, gray; layers of gray sandy and solid clay.	16	228 - 244

GEOLOGIC LOGS

Description	Thickness (feet)	Depth (feet below land surface)
N4150 (cont'd.)		
Clay, solid, gray, some thin layers of clayey fine sand.	8	244 - 252
Sand, fine to medium, gray; some thin layers of gray solid clay and lignite.	13	252 - 265
Sand, fine to medium, gray; trace of clay.	20	265 - 285
Sand, fine to medium, gray; layers of clayey sand and lignite.	31	285 - 316
Clay, silty and sandy, laminated, gray.	18	316 - 334
Sand, fine to medium, gray; trace of clay and lignite layers.	31	334 - 365
Sand, fine, clayey, gray; layers of gray sandy clay.	11	365 - 376
Sand, fine to medium, gray; layers of gray clayey sand, lignite, and pyrite.	7	376 - 383
Clay, silty and sandy, gray; some thin layers of gray fine to medium clayey sand and lignite.	20	383 - 403
Sand, fine to medium, gray; some layers of clay and lignite.	15	403 - 418
Sand, fine to medium, gray.	12	418 - 430
Sand, fine, gray; some clay.	16	430 - 446
Clay, solid, gray; layers of gray sandy silt.	9	446 - 455
Sand, fine to medium, gray; some layers of clay and lignite.	15	455 - 470
Sand, fine to medium, gray; some thin layers of clayey sand.	22	470 - 492
Sand, fine, clayey, gray.	14	492 - 506
Sand, fine to medium, gray; thin lignite layers.	16	506 - 522
Sand, fine to medium, gray; some clay.	12	522 - 534
Sand, very fine to fine, gray; some clay and silt.	34	534 - 568

Description	Thickness (feet)	Depth (feet below land surface
N4150 (cont'd.)		
Clay, solid, gray; some thin silt and lignite layers.	12	568 - 580
Clay, sandy and silty, gray; and layers of fine to medium clayey sand.	18	580 - 598
Sand, fine to medium, gray; trace of clay.	10	598 - 608
Clay, solid, gray; some thin layers of gray clayey medium sand.	23	608 - 631
Sand, medium to very coarse, gray.	8	631 - 639
Sand, fine to medium, gray; some thin layers of clay and lignite.	14	639 - 653
Sand, fine to coarse, gray; layers of lignite.	8	653 - 661
Sand, coarse to very coarse, gray; some thin layers of clayey coarse sand.	6	661 - 667
Clay, solid and silty, gray, laminated.	14	667 - 681
Sand, coarse to very coarse, gray; gravel; some layers of solid clay.	22	681 - 703
Sand, medium to coarse, gray.	22	703 - 725
Sand, medium to very coarse, gray; gravel; trace of clay; thin layers of gray solid clay.	27	725 - 752
?-ritan Formation:		
Clay, solid, gray.	13	752 - 765
Sand, fine, clayey, gray.	17	765 - 782
Sand, fine to medium, gray; some clay.	11	782 - 793
Clay, solid, light and dark gray and salmon red; some thin layers of silt.	33	793 - 826
3865		
?-ent and Upper Pleistocene Deposits:		
Fill and bog.	20	0 - 20

GEOLOGIC LOGS

Description	Thickness (feet)	Depth (feet below land surface)
N3865 (cont'd.)		
Upper Pleistocene Deposits:		
Sand, coarse, brown	13	20 - 33
Clay, gray ("20 foot" clay).	17	33 - 50
Sand, medium, brown.	10	50 - 60
Magothy (?) Formation:		
Clay, solid and silty, gray; thin layers of lignite	25	60 - 85
Sand, fine to coarse, gray; some layers of clayey sand, gray solid clay; lignite.	45	85 - 130
Clay, sandy, gray; layers of solid clay, medium-gray sand; lignite.	46	130 - 176
Sand, fine to medium, gray; trace of gray clay; lignite.	15	176 - 191
Clay, solid and sandy, gray; some layers of fine to medium gray sand.	35	191 - 226
Sand, medium, gray; some fine sand and clay.	19	226 - 245
Clay, sandy and silty, gray; some layers of lignite and gray clayey sand.	24	245 - 269
Sand, medium, clayey, gray.	27	269 - 296
Clay, solid, gray; thin layers of fine sand and silt.	12	296 - 308
Sand, fine to medium, clayey, gray; layers of sandy clay and lignite.	26	308 - 334
Clay, solid, dark-gray, and lignite.	15	334 - 349
Sand, medium, gray; layers of gray sandy clay, fine sand and lignite.	59	349 - 408
Sand, fine to medium, clayey gray; thin layers of solid gray clay.	34	408 - 442

GEOLOGIC LOGS

Description	Thickness (feet)	Depth (feet below land surface)
N3865(cont'd.)		
Sand, fine, clayey, gray; some layers of medium gray sand, solid clay, and lignite.	68	442 - 510
Sand, fine to medium, clayey, gray; thin layers of lignite.	32	510 - 542
Sand, medium to coarse, gray; some layers of fine clayey sand.	32	542 - 574
Clay, solid, gray.	17	574 - 591
Sand, very fine to fine gray; some layers of solid gray clay and fine to medium clayey sand.	23	591 - 614
Sand, medium to very coarse, gray; trace of gray clay.	24	614 - 638
Clay, solid, gray.	8	638 - 646
Sand, fine to medium, clayey, gray; some layers of coarse to very coarse sand, gravel; and lignite.	21	646 - 667
Clay, solid, light gray.	12	667 - 679
Sand, fine, clayey, gray; layers of medium to very coarse sand, gravel, and lignite.	33	679 - 712
Sand, fine to medium, clayey, gray.	36	712 - 748
Raritan Formation:		
Clay member:		
Clay, solid and silty, gray; some layers of sandy clay.	12	748 - 760
Sand, fine to medium, clayey, gray; layers of sandy clay and lignite.	26	760 - 786
Clay, solid and silty, light-brown and gray; layers of sandy clay and lignite.	63	786 - 849

GEOLOGIC LOGS

Description	Thickness (feet)	Depth (feet below land surface)
N8831		
Recent Deposits:		
Sand.	8	0 - 8
Clay, some meadow bog.	7	8 - 15
Upper Pleistocene Deposits:		
Sand, fine.	25	15 - 40
Sand and Gravel.	15	40 - 55
Clay, gray; ("20 foot" clay)	26	55 - 81
Magothy (?) Formation:		
Sand, fine.	21	81 - 102
N8763		
Recent Deposits:		
Fill.	8	0 - 8
Meadow Bog.	12	8 - 20
Upper Pleistocene Deposits:		
Sand and Gravel.	48	20 - 68
Clay, gray; ("20 foot" clay)	20	68 - 88
Pleistocene Deposits		
Clay, blue (Gardiners Clay?)	34	88 - 122
Magothy (?) Formation:		
Sand and Gravel	8	122 - 130

GEOLOGIC LOGS

Description	Thickness (feet)	Depth (feet below land surface)
N8849		
Recent Deposits:		
Fill.	12	0 - 12
Meadow Bog.	8	12 - 20
Upper Pleistocene Deposits:		
Sand, coarse.	10	20 - 30
Sand, coarse; some stones.	12	30 - 42
Sand, fine; some stones.	17	42 - 59
Clay ("20 foot" clay).	12	59 - 71
Clay; some sand ("20 foot" clay)	14	71 - 85
Magothy (?) Formation:		
Sand, fine.	14	85 - 95
N8806		
Recent Deposits:		
Sand and gravel.	8	0 - 8
Meadow Bog.	11	8 - 19
Upper Pleistocene Deposits:		
Sand and gravel.	27	19 - 46
Clay, gray; ("20 foot" clay)	56	46 - 102
Magothy (?) Formation:		
Sand, coarse	31	102 - 133
Sand, fine.	15	133 - 148
Clay, white	3	148 - 151
Sand, fine.	12	151 - 163
Sand, fine; some wood.	10	163 - 173

GEOLOGIC LOGS

Description	Thickness (feet)	Depth (feet below land surface)
N8806 (cont'd.)		
Sand, fine, some clay.	11	173 - 184
Sand, fine.	31	184 - 215
Sand; some clay, wood.	10	215 - 225
18770		
Upper Pleistocene Deposits:		
Sand, fine.	10	0 - 10
Sand and gravel.	51	10 - 61
Clay, gray; ("20 foot" clay).	12	61 - 73
agothy (?) Formation:		
Gravel.	10	73 - 83
Sand and gravel.	4	83 - 87
Sand, fine.	39	87 - 126
Sand, coarse.	20	126 - 146


NEW YORK WATER SERVICE CORP
VILLAGE OF FREEPORT
FREEPORT
OINT LOOKOUT W.D.
3895
5259
3894
8672
3463
5187
3832
6893
3728
1601
1337-45
7831
5653
8250
3668
8264
5320
5319
5218
4756
698
580
634
2577
3186-87
3437
8253
7407
0285-88
952-1000
1303-25
1942
871-900
1001-30
1302
1948-57
751-800
1402-15
1495-96
4132
5153
2613
8657
167
68
69
133
132
134
2796
5227
site
(Kilborn, 1982)
1 mile
heavy circled well permit numbers are screened in upper glacial aquifer (see following pages)

WELL NUMBER	OWNER OR WELL USER	MAP COORD	YEAR COMP-LETED	ALTITUDE OF LSD (FT ABOVE NGVD)	USE OF WATER	USE OF WELL	DEPTH OF WELL (FT)	SCREEN SETTING (FT ABOVE OR BELOW (-) NGVD)	TOTAL SCREEN LENGTH (FT)	DIAM OF WELL (IN)	WATER LEVEL (FT BELOW LSD)	DATE OF MEAS. (M-D-Y)	LIFT TYPE	AQUIFER DEVEL-OPED	SPECIFIC CAPACITY (GPM/FT)
N 712	L.I. WATER CORP	B 5	1949	5	UNSD	DEST	152						NONE	JAMECO	
N 712	L.I. WATER CORP	B 5	1964	5	P.S.	WTDR	149	-124 TO -144	20	8			OTHR	JAMECO	
N 713	QUEENS CO WTR	B 5	1905	5	UNSD	DEST	158						NONE	JAMECO	
N 713	L.I. WATER CORP	B 5	1935	5	UNSD	DEST	159						NONE	JAMECO	
N 713	L.I. WATER CORP	B 5	1947	5	UNSD	DEST	153	-126 TO -147	21	8			NONE	JAMECO	
N 713	L.I. WATER CORP	B 5	1962	5	P.S.	WTDR	150	-124 TO -144	20	8	14.1	06-13-62	OTHR	JAMECO	36
N 714	QUEENS CO WTR	B 5	1907	5	UNSD	DEST	157						NONE	JAMECO	
N 714	L.I. WATER CORP	B 5		5	UNSD	DEST	155						NONE	JAMECO	
N 714	L.I. WATER CORP	B 5	1951	5	UNSD	DEST	151						NONE	JAMECO	
N 715	L.I. WATER CORP	C 6	1929	42	P.S.	WTDR	35						OTHR	UPGLAC	
N 716	L.I. WATER CORP	C 6	1929	42	P.S.	WTDR	35						OTHR	UPGLAC	
N 717	L.I. WATER CORP	C 6	1929	42	P.S.	WTDR	35						OTHR	UPGLAC	
N 718	MANH.-LAKE. WD	D 5		8	UNSD	DEST	150			8			NONE	UPGLAC	
N 719	MANH.-LAKE. WD	D 5		8	UNSD	DEST	150			4			NONE	UPGLAC	
N 720	MANH.-LAKE. WD	D 5		8	UNSD	DEST	150			4			NONE	UPGLAC	
N 724	MANH.-LAKE. WD	D 5		8	UNSD	DEST	150			4			NONE	UPGLAC	
N 728	N.Y.WTR.SERVICE	C 7	1927	13	UNSD	DEST	40						NONE	UPGLAC	
N 729	N.Y.WTR.SERVICE	C 8		24	UNSD	DEST							NONE	UPGLAC	
N 732	GARDEN CITY	C 6	1907	83	UNSD	DEST	90			20			NONE	UPGLAC	
N 733	OYSTER BAY WD	E 7		18	UNSD	DEST	350			6			NONE	GLACIAL	
N 734	OYSTER BAY WD	E 7		18	UNSD	UNSD	420			10			NONE	GLACIAL	12
N 735	OYSTER BAY WD	E 7		18	P.S.	WTDR	100						OTHR	UPGLAC	
N 736	OYSTER BAY WD	E 7		20	P.S.	WTDR	70			6			OTHR	UPGLAC	
N 737	JAMAICA WTR CO	C 5		45	UNSD	DEST	75						NONE	UPGLAC	
N 738	JAMAICA WTR CO	C 5		45	UNSD	DEST	75						NONE	UPGLAC	
N 739	JAMAICA WTR CO	C 5		45	UNSD	DEST	75						NONE	UPGLAC	
N 740	JAMAICA WTR CO	C 5		45	UNSD	DEST	75						NONE	UPGLAC	
N 741	JAMAICA WTR CO	C 5		45	UNSD	DEST	75						NONE	UPGLAC	
N 742	JAMAICA WTR CO	C 5		45	UNSD	DEST	75						NONE	UPGLAC	
N 743	JAMAICA WTR CO	C 5		45	UNSD	DEST	75						NONE	UPGLAC	
N 744	JAMAICA WTR CO	C 5		45	UNSD	DEST	75						NONE	UPGLAC	
N 745	JAMAICA WTR CO	C 5		45	UNSD	DEST	75						NONE	UPGLAC	
N 746	BETHPAGE WD	C 8		104			120	22 TO -16	38	10			NONE	MAGOTHY	12
N 747	BETHPAGE WD	C 8		105	UNSD	DEST	242	-87 TO -129	42	10	41	12-20-44	NONE	MAGOTHY	29
N 750	WESTBURY WD	D 6		110	ARCO	RECH	368			8			NONE	MAGOTHY	
N 751	NEW YORK CITY	B 7		14	UNSD	DEST	91			6			NONE	GLACIAL	
N 752	NEW YORK CITY	B 7		14	UNSD	DEST	90			6			NONE	GLACIAL	
N 753	NEW YORK CITY	B 7		14	UNSD	DEST	92			6			NONE	GLACIAL	
N 754	NEW YORK CITY	B 7		14	UNSD	DEST	94			6			NONE	GLACIAL	
N 755	NEW YORK CITY	B 7		14	UNSD	DEST	92			6			NONE	GLACIAL	

Kilburn 1982

WELL NUMBER	OWNER OR WELL USER	MAP COORD	YEAR COMP-LETED	ALTITUDE OF LSD (FT ABOVE NGVD)	USE OF WATER	USE OF WELL	DEPTH OF WELL (FT)	SCREEN SETTING (FT ABOVE OR BELOW (-) NGVD)	TOTAL SCREEN LENGTH (FT)	DIAM OF WELL (IN)	WATER LEVEL (FT BELOW LSD)	DATE OF MEAS. (M-D-Y)	LIFT TYPE	AQUIFER DEVEL-OPED	SPECIFIC CAPACITY (GPM/FT)
N 1324	NEW YORK CITY	B 7		5	UNSD	DEST	40			8			NONE	UPGLAC	
N 1325	NEW YORK CITY	B 7		5	UNSD	DEST	35			10			NONE	UPGLAC	
N 1327	SEA CLIFF WATER	E 6	1940	10	P.S.	WTDR	126	-91 TO -116	25	24	FLOWING	05-22-40	OTHR	MAGOTHY	
N 1328	MANH.-LAKE. WD	D 5	1941	177	UNSD	WTDR	746	-475 TO -565	90	24	157	02-06-41	TURB	LLOYD	41
N 1329	WESTBURY WD	D 6		110	UNSD	DEST	250	-90 TO -110	20	8			NONE	MAGOTHY	
N 1337	L.I. WATER CORP	C 6	1929	42	P.S.	WTDR	35						NONE	UPGLAC	
N 1338	L.I. WATER CORP	C 6	1929	42	P.S.	WTDR	35						OTHR	UPGLAC	
N 1339	L.I. WATER CORP	C 6	1930	42	P.S.	WTDR	35						OTHR	UPGLAC	
N 1340	L.I. WATER CORP	C 6	1930	42	P.S.	WTDR	35						OTHR	UPGLAC	
N 1341	L.I. WATER CORP	C 6	1930	42	P.S.	WTDR	35						OTHR	UPGLAC	
N 1342	L.I. WATER CORP	C 6	1930	42	P.S.	WTDR	35						OTHR	UPGLAC	
N 1343	L.I. WATER CORP	C 6	1930	42	P.S.	WTDR	35						OTHR	UPGLAC	
N 1344	L.I. WATER CORP	C 6	1909	42	P.S.	WTDR	39			18			OTHR	UPGLAC	
N 1345	L.I. WATER CORP	C 6	1923	42	P.S.	WTDR	39			18			OTHR	UPGLAC	
N 1346	QUEENS CO WTR	B 5	1907	5	UNSD	DEST	147						NONE	JAMECO	
N 1346	L.I. WATER CORP	B 5	1933	5	UNSD	DEST	152						NONE	JAMECO	
N 1346	L.I. WATER CORP	B 5	1962	5	P.S.	WTDR	141	-115 TO -135	20	8	14.2	06-29-62	OTHR	JAMECO	54
N 1347	QUEENS CO WTR	B 5	1907	5	UNSD	DEST	150						NONE	JAMECO	
N 1347	L.I. WATER CORP	B 5	1929	5	UNSD	DEST	150						NONE	JAMECO	
N 1347	L.I. WATER CORP	B 5	1947	5	UNSD	DEST	152						NONE	JAMECO	
N 1347	L.I. WATER CORP	B 5	1962	5	P.S.	WTDR	143	-116 TO -136	20	8	16.5	06-18-62	OTHR	JAMECO	57
N 1348	QUEENS CO WTR	B 5	1907	5	UNSD	DEST	154						NONE	JAMECO	
N 1348	L.I. WATER CORP	B 5	1934	5	UNSD	DEST	152						NONE	JAMECO	
N 1348	L.I. WATER CORP	B 5	1949	5	UNSD	DEST	150						NONE	JAMECO	
N 1348	L.I. WATER CORP	B 5	1964	5	P.S.	WTDR	148	-123 TO -143	20	8			OTHR	JAMECO	
N 1349	QUEENS CO WTR	B 5	1907	5	UNSD	DEST	146						NONE	JAMECO	
N 1349	L.I. WATER CORP	B 5	1923	5	UNSD	DEST	146						NONE	JAMECO	
N 1349	L.I. WATER CORP	B 5	1948	5	UNSD	DEST	148						NONE	JAMECO	
N 1349	L.I. WATER CORP	B 5	1964	5	P.S.	WTDR	148	-123 TO -143	20	8			OTHR	JAMECO	46
N 1350	QUEENS CO WTR	B 5	1905	5	UNSD	DEST	143						NONE	JAMECO	
N 1350	L.I. WATER CORP	B 5	1934	5	UNSD	DEST	147						NONE	JAMECO	
N 1350	L.I. WATER CORP	B 5	1952	5	UNSD	DEST	146						NONE	JAMECO	
N 1351	QUEENS CO WTR	B 5	1905	5	UNSD	DEST	150						NONE	JAMECO	
N 1351	L.I. WATER CORP	B 5	1935	5	UNSD	DEST	148						NONE	JAMECO	
N 1351	L.I. WATER CORP	B 5	1962	5	P.S.	WTDR	147	-121 TO -141	20	8	15.1	06-22-62	OTHR	JAMECO	58
N 1352	QUEENS CO WTR	B 5	1905	5	UNSD	DEST	150						NONE	JAMECO	
N 1352	L.I. WATER CORP	B 5	1930	5	UNSD	DEST	147						NONE	JAMECO	
N 1352	L.I. WATER CORP	B 5	1952	5	UNSD	DEST	147						NONE	JAMECO	
N 1352	L.I. WATER CORP	B 5	1964	5	P.S.	WTDR	147	-122 TO -142	20	8	10.8	01-06-64	OTHR	JAMECO	29
N 1353	QUEENS CO WTR	B 5	1905	5	UNSD	DEST	159						NONE	JAMECO	

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WELL NUMBER	OWNER OR WELL USER	MAP COORD	YEAR COMP-LETED	ALTITUDE OF LSD (FT ABOVE NGVD)	USE OF WATER	USE OF WELL	DEPTH OF WELL (FT)	SCREEN SETTING (FT ABOVE OR BELOW (-) NGVD)	TOTAL SCREEN LENGTH (FT)	DIAM OF WELL (IN)	WATER LEVEL (FT BELOW LSD)	DATE OF MEAS. (M-D-Y)	LIFT TYPE	AQUIFER DEVEL-OPED	SPECIFIC CAPACITY (GPM/FT)
N 1397	L.I. WATER CORP	B 5	1962	5	P.S.	WTDR	143	-117 TO -137	20	8	10.1	06-04-62	OTHR	JAMECO	35
N 1398	QUEENS CO WTR	B 5	1904	5	UNSD	DEST	140						NONE	JAMECO	
N 1398	L.I. WATER CORP	B 5	1926	5	UNSD	DEST	140						NONE	JAMECO	
N 1398	L.I. WATER CORP	B 5	1949	5	UNSD	DEST	117	-91 TO -111	20	8			NONE	JAMECO	
N 1399	QUEENS CO WTR	B 5	1908	5	UNSD	DEST	142						NONE	JAMECO	
N 1399	L.I. WATER CORP	B 5	1941	5	UNSD	DEST	136						NONE	JAMECO	
N 1399	L.I. WATER CORP	B 5	1962	5	P.S.	WTDR	136	-110 TO -130	20	8	8.5	05-28-62	OTHR	JAMECO	36
N 1400	QUEENS CO WTR	B 5	1908	5	UNSD	DEST	136						NONE	JAMECO	
N 1400	L.I. WATER CORP	B 5	1928	5	UNSD	DEST	137						NONE	JAMECO	
N 1400	L.I. WATER CORP	B 5	1950	5	UNSD	DEST	115	-89 TO -108	19	8			NONE	JAMECO	
N 1401	L.I. WATER CORP	B 5	1926	5	UNSD	DEST	151						NONE	JAMECO	
N 1401	L.I. WATER CORP	B 5	1946	5	P.S.	WTDR	146	-120 TO -141	21	8			NONE	JAMECO	
N 1402	L.I. WATER CORP	B 6		26	UNSD	DEST	29						NONE	UPGLAC	
N 1402	L.I. WATER CORP	B 6	1955	19	P.S.	WTDR	32						OTHR	UPGLAC	
N 1403	L.I. WATER CORP	B 6	1912	26	P.S.	WTDR	35			18			OTHR	UPGLAC	
N 1404	L.I. WATER CORP	B 6		21	UNSD	DEST	29						NONE	UPGLAC	
N 1404	L.I. WATER CORP	B 6		19	P.S.	WTDR							OTHR	UPGLAC	
N 1405	L.I. WATER CORP	B 6		21	UNSD	DEST	29						NONE	UPGLAC	
N 1405	L.I. WATER CORP	B 6	1955	19	P.S.	WTDR	35						OTHR	UPGLAC	
N 1406	L.I. WATER CORP	B 6		21	UNSD	DEST	30						NONE	UPGLAC	
N 1406	L.I. WATER CORP	B 6	1955	19	P.S.	DEST	32						OTHR	UPGLAC	
N 1407	L.I. WATER CORP	B 6	1913	21	P.S.	WTDR	35						OTHR	UPGLAC	
N 1408	L.I. WATER CORP	B 6	1921	21	P.S.	WTDR	35						OTHR	UPGLAC	
N 1409	L.I. WATER CORP	B 6	1924	21	P.S.	WTDR	35						OTHR	UPGLAC	
N 1410	L.I. WATER CORP	B 6	1924	20	P.S.	WTDR	35						OTHR	UPGLAC	
N 1411	L.I. WATER CORP	B 6	1925	22	P.S.	WTDR	35						OTHR	UPGLAC	
N 1412	L.I. WATER CORP	B 6	1925	20	P.S.	WTDR	22						OTHR	UPGLAC	
N 1413	L.I. WATER CORP	B 6	1925	20	P.S.	WTDR	23						OTHR	UPGLAC	
N 1414	L.I. WATER CORP	B 6	1925	19	P.S.	WTDR	26						OTHR	UPGLAC	
N 1415	L.I. WATER CORP	B 6	1925	19	P.S.	WTDR	22						OTHR	UPGLAC	
N 1489	L.I. WATER CORP	B 5		5	UNSD	DEST	32						NONE	UPGLAC	
N 1490	L.I. WATER CORP	B 5		5	UNSD	DEST	31						NONE	UPGLAC	
N 1490	L.I. WATER CORP	B 5	1951	5	UNSD	DEST	32						NONE	UPGLAC	
N 1491	L.I. WATER CORP	B 5		5	UNSD	DEST							NONE	UPGLAC	
N 1491	L.I. WATER CORP	B 5	1951	5	UNSD	DEST	31						NONE	UPGLAC	
N 1492	L.I. WATER CORP	B 5		3	UNSD	DEST	25						NONE	UPGLAC	
N 1492	L.I. WATER CORP	B 5	1954	3	UNSD	DEST	27						NONE	UPGLAC	
N 1493	L.I. WATER CORP	B 5		5	UNSD	DEST	32						NONE	UPGLAC	
N 1493	L.I. WATER CORP	B 5	1953	5	UNSD	DEST	28						NONE	UPGLAC	
N 1494	QUEENS CO WTR	B 5	1924	5	UNSD	DEST	139						NONE	JAMECO	

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Table 1.—Well-completion data for public water-supply wells in Nassau County from 1920 to 1977 (continued)

WELL NUMBER	OWNER OR WELL USER	MAP COORD	YEAR COMP-LETED	ALTITUDE OF LSD (FT ABOVE NGVD)	USE OF WATER	USE OF WELL	DEPTH OF WELL (FT)	SCREEN SETTING (FT ABOVE OR BELOW (-) NGVD)	TOTAL SCREEN LENGTH (FT)	DIAM OF WELL (IN)	WATER LEVEL (FT BELOW LSD)	DATE OF MEAS. (M-D-Y)	LIFT TYPE	AQUIFER DEVEL-OPED	SPECIFIC CAPACITY (GPM/FT)
N 1494	L.I. WATER CORP	B 5	1949	5	UNSD	DEST	138	-113 TO -131	18	8			NONE	JAMECO	
N 1495	L.I. WATER CORP	B 6	1925	19	P.S.	WTDR	22						OTHR	UPGLAC	
N 1496	L.I. WATER CORP	B 6		19	UNSD	DEST							NONE	UPGLAC	
N 1501	L.I. WATER CORP	B 5	1943	5	UNSD	DEST	30						NONE	UPGLAC	
N 1502	L.I. WATER CORP	B 5	1943	5	UNSD	DEST	30						NONE	UPGLAC	
N 1502	L.I. WATER CORP	B 5	1963	5	P.S.	WTDR	36	-21 TO -31	10	8	3.3	12-00-63	OTHR	UPGLAC	
N 1503	L.I. WATER CORP	B 5	1950	5	UNSD	DEST							NONE	UPGLAC	
N 1503	L.I. WATER CORP	B 5	1964	5	P.S.	WTDR	30	-15 TO -25	10	8	2.7	02-04-64	OTHR	UPGLAC	18
N 1504	L.I. WATER CORP	B 5	1940	5	UNSD	DEST	29						NONE	UPGLAC	
N 1504	L.I. WATER CORP	B 5	1953	5	P.S.	WTDR	34						OTHR	UPGLAC	
N 1505	L.I. WATER CORP	B 5	1940	5	UNSD	DEST	29						NONE	UPGLAC	
N 1505	L.I. WATER CORP	B 5	1953	5	P.S.	WTDR	34						OTHR	UPGLAC	
N 1506	L.I. WATER CORP	B 5	1937	5	UNSD	DEST	35						NONE	UPGLAC	
N 1506	L.I. WATER CORP	B 5	1953	5	UNSD	DEST	32						NONE	UPGLAC	
N 1506	L.I. WATER CORP	B 5	1964	5	P.S.	WTDR	32	-16 TO -26	10	8	4.5	01-30-64	OTHR	UPGLAC	23
N 1507	L.I. WATER CORP	B 5	1943	5	UNSD	DEST	30						NONE	UPGLAC	
N 1507	L.I. WATER CORP	B 5	1954	5	P.S.	WTDR	31						OTHR	UPGLAC	
N 1508	L.I. WATER CORP	B 5	1937	5	UNSD	DEST	33						NONE	UPGLAC	
N 1509	L.I. WATER CORP	B 5	1937	5	UNSD	DEST	33						NONE	UPGLAC	
N 1509	L.I. WATER CORP	B 5	1964	5	P.S.	WTDR	31	-15 TO -25	10	8	6	01-28-64	OTHR	UPGLAC	19
N 1510	L.I. WATER CORP	B 5	1940	5	UNSD	DEST	29						NONE	UPGLAC	
N 1510	L.I. WATER CORP	B 5	1964	5	P.S.	WTDR	31	-15 TO -25	10	8	4.7	02-20-64	OTHR	UPGLAC	20
N 1511	L.I. WATER CORP	B 5	1937	5	UNSD	DEST	33						NONE	UPGLAC	
N 1511	L.I. WATER CORP	B 5	1950	5	UNSD	DEST	33						NONE	UPGLAC	
N 1512	L.I. WATER CORP	B 5	1940	5	UNSD	DEST	29						NONE	UPGLAC	
N 1512	L.I. WATER CORP	B 5	1949	5	UNSD	DEST	29						NONE	UPGLAC	
N 1513	L.I. WATER CORP	B 5	1940	5	UNSD	DEST	28						NONE	UPGLAC	
N 1513	L.I. WATER CORP	B 5	1950	5	UNSD	DEST	30						NONE	UPGLAC	
N 1514	L.I. WATER CORP	B 5	1937	5	UNSD	DEST	34						NONE	UPGLAC	
N 1514	L.I. WATER CORP	B 5	1950	5	UNSD	DEST	32						NONE	UPGLAC	
N 1515	L.I. WATER CORP	B 5	1937	5	UNSD	DEST	34						NONE	UPGLAC	
N 1515	L.I. WATER CORP	B 5	1949	5	UNSD	DEST	32						NONE	UPGLAC	
N 1516	L.I. WATER CORP	B 5	1940	5	UNSD	DEST	29						NONE	UPGLAC	
N 1516	L.I. WATER CORP	B 5	1950	5	UNSD	DEST	30						NONE	UPGLAC	
N 1516	L.I. WATER CORP	B 5	1964	5	P.S.	WTDR	31	-16 TO -26	10	8	6.1	01-27-64	OTHR	UPGLAC	17
N 1517	L.I. WATER CORP	B 5	1937	5	UNSD	DEST	32						NONE	UPGLAC	
N 1517	L.I. WATER CORP	B 5	1950	5	UNSD	DEST	30						NONE	UPGLAC	
N 1517	L.I. WATER CORP	B 5	1964	5	P.S.	WTDR	31	-16 TO -26	10	8	4.3	01-28-64	OTHR	UPGLAC	21
N 1518	L.I. WATER CORP	B 5	1937	5	UNSD	DEST	33						NONE	UPGLAC	
N 1518	L.I. WATER CORP	B 5	1953	5	P.S.	WTDR	41						OTHR	UPGLAC	

WELL NUMBER	OWNER OR WELL USER	MAP COORD	YEAR COMP-LETED	ALTITUDE OF LSD (FT ABOVE NGVD)	USE OF WATER	USE OF WELL	DEPTH OF WELL (FT)	SCREEN SETTING (FT ABOVE OR BELOW (-) NGVD)	TOTAL SCREEN LENGTH (FT)	DIAM OF WELL (IN)	WATER LEVEL (FT BELOW LSD)	DATE OF MEAS. (M-D-Y)	LIFT TYPE	AQUIFER DEVEL-OPED	SPECIFIC CAPACITY (GPM/FT)
N 3475	JERICHO WD	D 7	1950	208	P.S.	WTDR	487	-224 TO -274	50	18	121	07-22-50	TURB	MAGOTHY	36
N 3486	OYSTER BAY WD	E 7	1950	18	P.S.	WTDR	102	-52 TO -84	32	12		04-07-50		UPGLAC	
N 3488	HICKSVILLE WD	C 7	1951	117	UNSD	UNSD	169	1 TO -52	53	12	44	10-07-50	TURB	MAGOTHY	32
N 3520	L.I. WATER CORP	C 6	1951	32	P.S.	WTDR	178	-94 TO -146	52	12	7	03-01-51	TURB	MAGOTHY	7
N 3523	MANH.-LAKE. WD	D 5	1950	201	P.S.	WTDR	326	-89 TO -119	30	20	140	08-16-50	SUBM	MAGOTHY	9
N 3540	PLANDOME	D 5	1951	50	P.S.	WTDR	207	-105 TO -157	52	12	33	07-20-50	TURB	UPGLAC	13
N 3552	HICKSVILLE WD	C 7	1951	119	UNSD	UNSD	169	3 TO -50	53	12	48	11-27-50	TURB	MAGOTHY	50
N 3553	HICKSVILLE WD	C 7	1951	117	UNSD	UNSD	152	18 TO -35	53	12	41	11-17-50	TURB	MAGOTHY	21
N 3561	OYSTER BAY WD	E 7	1950	18	P.S.	WTDR	120	-70 TO -100	30	12	FLOWING	08-31-50		UPGLAC	
N 3564	N.Y.WTR.SERVICE	C 8	1951	25	UNSD	DEST	69	-8 TO -24	16	16	11	09-25-51	NONE	UPGLAC	
N 3603	FRANKLIN SQ. WD	C 5	1951	72	P.S.	WTDR	498	-371 TO -421	50	18	28	04-26-51	TURB	MAGOTHY	9
N 3604	FRANKLIN SQ. WD	C 5	1951	75	P.S.	WTDR	498	-363 TO -423	60	18	28	01-12-51	TURB	MAGOTHY	12
N 3605	FRANKLIN SQ. WD	C 5	1951	45	P.S.	WTDR	443	-353 TO -393	40	18	12	02-19-51	TURB	MAGOTHY	37
N 3618	LEVITTOWN WD	C 7	1951	89	P.S.	WTDR	420	-288 TO -329	41	16	33.7	02-08-51	TURB	MAGOTHY	20
N 3668	HEMPSTEAD	C 6	1953	55	P.S.	WTDR	505	-395 TO -445	50	20	17	02-02-53	TURB	MAGOTHY	45
N 3672	GARD. CTY PK WD	C 5	1951	105	P.S.	WTDR	452	-302 TO -342	40	18	44	04-06-51	TURB	MAGOTHY	14
N 3673	GARD. CTY PK WD	C 5	1951	101	UNSD	UNSD	434	-288 TO -328	40	18	35	06-01-51	TURB	MAGOTHY	26
N 3680	N.Y.WTR.SERVICE	C 7	1951	30	P.S.	WTDR	332	-240 TO -298	58	12	4	05-02-51	TURB	MAGOTHY	18
N 3687	LONG BEACH	B 6	1951	5	P.S.	WTDR	1252	-1189 TO -1239	50	10	FLOWING	07-05-51	TURB	LLOYD	17
N 3695	MITCHELL FIELD	C 6	1934	90	UNSD	UNSD	500		30	8				MAGOTHY	
N 3696	MITCHELL FIELD	C 6	1934	90	UNSD	UNSD	444		30	8				MAGOTHY	
N 3697	MITCHELL FIELD	C 6	1934	91	UNSD	UNSD	432		30	8				MAGOTHY	
N 3698	MITCHELL FIELD	C 6	1934	94	UNSD	UNSD	472		8	30				MAGOTHY	
N 3704	W.HEMP-H.GDS.WD	C 6	1951	55	P.S.	WTDR	159	-51 TO -104	53	16	25.1	06-04-51		UPGLAC	80
N 3720	JAMAICA WTR CO	C 5	1953	33	P.S.	WTDR	521	-443 TO -483	40	18	8	12-12-51	TURB	MAGOTHY	26
N 3722	L.I. WATER CORP	C 6	1951	42	P.S.	WTDR	81	-13 TO -39	26	12	13.3	06-07-51	TURB	UPGLAC	13
N 3732	ALBERTSON WD	D 6	1952	140	P.S.	WTDR	355	-170 TO -210	40	18	71	08-26-52	TURB	MAGOTHY	18
N 3733	ALBERTSON WD	D 6	1952	141	P.S.	WTDR	455	-269 TO -309	40	18	69	28-08-52	TURB	MAGOTHY	15
N 3745	ROCKVILLE CTR	C 6	1952	45	P.S.	WTDR	597	-497 TO -547	50	18	20	07-24-51	TURB	MAGOTHY	28
N 3780	N.Y.WTR.SERVICE	C 8	1951	58	UNSD	DEST	142	-31 TO -84	53	16	16	11-14-51	TURB	UPGLAC	56
N 3781	L.I. WATER CORP	C 5	1952	19	P.S.	WTDR	435	-351 TO -411	60	16	0	12-04-51	TURB	MAGOTHY	22
N 3782	L.I. WATER CORP	C 5	1952	21	UNSD	DEST	410	-326 TO -387	61	16	4	01-10-52	TURB	MAGOTHY	15
N 3832	L.I. WATER CORP	C 6	1951	42	P.S.	WTDR	95	-23 TO -53	30	12	16.8	11-26-51	TURB	MAGOTHY	14
N 3876	BETHPAGE WD	C 8	1952	91	UNSD	UNSD	386	-237 TO -295	58	16	35	03-20-52	TURB	MAGOTHY	31
N 3878	HICKSVILLE WD	D 7	1952	150	P.S.	WTDR	428	-225 TO -278	53	18	67	07-22-52	TURB	MAGOTHY	53
N 3881	GARDEN CITY	C 5	1953	86	P.S.	WTDR	470	-340 TO -380	40	18	26	04-03-53	TURB	MAGOTHY	11
N 3886	N.Y.WTR.SERVICE	C 8	1952	23	UNSD	DEST	75	-19 TO -52	33	16	13.7	04-15-52	TURB	UPGLAC	
N 3892	GLEN COVE	E 6	1953	145	P.S.	WTDR	251	6 TO -101	54	16	87	10-07-53		UPGLAC	40
N 3893	N.Y.WTR.SERVICE	C 8	1952	58	P.S.	WTDR	150						TURB	MAGOTHY	43
N 3894	N.Y.WTR.SERVICE	C 7	1953	30	P.S.	WTDR	358				5.7	03-23-53	TURB	MAGOTHY	68

NASSAU COUNTY

ID NO	COMMUNITY WATER SYSTEM	POPULATION	SOURCE
	Municipal Community		
1	Albertson Water District	13500.	Wells
2	Bayville Village	7500.	Wells
3	Bethpage Water District	32000.	Wells
4	Bowling Green Water District	12000.	Wells
5	Carle Place Water District	11000.	Wells
6	Citizens Water Supply Company	30000.	Wells
7	Deforest Drive Association	25.	Wells
8	East Meadow Water District	52000.	Wells
9	Farmingdale Village	7946.	Wells
10	Franklin Square Water District	20000.	Wells
11	Freeport Village	38272.	Wells
12	Garden City Park Water District	22596.	Wells
13	Garden City Village	22927.	Wells
14	Glen Cove City	24618.	Wells
15	Hempstead Village	40404.	Wells
16	Hicksville Water District	58000	Wells
17	Jamaica Water Supply Company	128448.	Wells
18	Jericho Water District	64000.	Wells
19	Levittown Water District	50000.	Wells
20	Lido-Point Lookout Water District	10000.	Wells
21	Locust Valley Water District	8500.	Wells
22	Long Beach City	34073.	Wells
23	Long Island Water Corporation	258936.	Wells
24	Manhasset-Lakeville Water District	44730.	Wells
25	Massapequa Water District	52000.	Wells
26	Mill Neck Estates Water Supply	240.	Wells
27	Mineola Village	20600.	Wells
28	New York Water Service	172180.	Wells
29	Old Westbury Village	3100.	Wells
30	Oyster Bay Water District	10225.	Wells
31	Plainview Water District	40000.	Wells
32	Plandome Village	2616.	Wells
33	Port Washington Water District	35000.	Wells
34	Rockville Centre Village	25405.	Wells
35	Roosevelt Field Water District	1640.	Wells
36	Roslyn Water District	27500.	Wells
37	Sands Point Village	3002.	Wells
38	Sea Cliff Water Company	17850.	Wells
39	Sel-Bra Acres Water Supply	80.	Wells
40	South Farmingdale Water District	49900.	Wells
41	Split Rock Water Supply	25.	Wells
42	Uniondale Water District	25000.	Wells
43	West Hempstead-Hempstead Garden Water District	32000.	Wells
44	Westbury Water District	20050.	Wells
45	Williston Park Village	8216.	Wells
	Non-Municipal Community		
46	Community Hospital at Glen Cove	1350.	Wells
47	Planting Fields Arboretum	90.	Wells
48	Stuart, Walker, Zimmer Water Supply	41.	Wells

TAT-02-F-00789

AN ASSESSMENT OF THE ENVIRONMENTAL INFLUENCE OF THE OCEANSIDE LANDFILL, AND SCREENING OF THE MERRICK LANDFILL, LONG ISLAND, NEW YORK

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ENVIRONMENTAL QUALITY
REGION 1

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MAY 17 1984
ENVIRONMENTAL QUALITY
REGION 1

March 28, 1984

TDD #2-8311-36D

Prepared By:
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EXECUTIVE SUMMARY

A sampling study was conducted at the Oceanside Landfill in Oceanside, New York to establish the effect of the landfill on the surrounding environment. This multi-media, multi-agency screening analysis was conducted from September 18 through October 19, 1983 by the U.S. Environmental Protection Agency, the New York State Department of Environmental Conservation, the Nassau County Department of Health and the Town of Hempstead Department of Conservation & Waterways. The study evaluated potential air and water quality impacts of the landfill. It showed, as discussed in more detail below and extensively in this report that the during the sampling period, Oceanside Landfill had no significant environmental impact on the surrounding area. An air quality screening study was carried out by the U.S. Environmental Protection Agency at the Merrick Landfill, Merrick, New York and is also discussed below.

The air analysis at Oceanside was carried out using several state-of-the-art methods to establish the presence or absence of classes of chemical compounds associated with hazardous wastes, toxic wastes, and landfills including:

- All classes of organic compounds including halogenated organics, chlorinated and other solvents, aromatics, olefinic hydrocarbons, acids, and the methane fraction or lower weight hydrocarbons;

- Oxygen, sulfur and/or nitrogen containing compounds including amines, ketones, esters, alcohols and mercaptans;

- Inorganics such as arsine, phosphine, hydrocyanic acid, halogens, the halogen acids including hydrofluoric, ammonia, sulfur oxides and hydrogen sulfide.

- Aromatic amines

- Vinyl chloride

- Beta-gamma radiation

This sampling did not show the existence of any particular compound of concern or class of compounds at levels generally considered significant. This analysis was conducted at very low (ppb range) detection limits. In addition, a scan for potential radioactivity showed no contamination as indicated by the absence of beta or gamma emissions above background.

A tandem mass spectrometer TAGA 6000, adsorption followed by analysis, and gas chromatography survey techniques were utilized as discussed in the report. Sampling was conducted at several types of locations on and off the landfill.

With regard to water quality, a total of sixteen locations including surface water stations, leachate seeps, and the outfall of the landfill incinerator process water were sampled. Water and sediment samples were collected at each location. All water samples were analyzed for priority pollutants, cyanide, phenolics and total organic carbon. All sediment samples were analyzed for priority pollutants (excluding volatile organics) and phenolics. Surface water and leachate stations were also sampled for bacteriological parameters.

The sampling results show that during the period sampled, the Oceanside Landfill did not have a detectable influence on the adjacent estuarine waters or sediments. None of the data indicate that the landfill is a significant source of pollutants. The data do suggest that the incinerator process water outfall, although within water quality criteria, may be a source of metals. The data suggest also that the upper reaches of the Domar Canal and Bedells Creek are being influenced by urban runoff.

A brief air quality screening was conducted at the Merrick Landfill. This screening consisted of sampling seven sites once with the TAGA 6000 and field survey instruments. Samples were taken of ambient air on-site and downwind, off-site; over a leachate seep and within a methane vent pipe. Basically, the findings are similar to the Oceanside study. The sampling did not show the existence of any particular compound of concern or class of compounds at levels generally considered significant or unsafe. No other sampling was conducted at Merrick under this study.

As a result of this field investigation, no major influence on the surrounding environment was detected during the sampling period at or near the Merrick or Oceanside Landfills which warrants further investigation or concern for environmental degradation or public health safety.

1. PRINCIPAL CONCLUSIONS

An intensive survey has been conducted at the Oceanside Landfill in Oceanside, New York. The purpose of this program was to determine the extent of any environmental impact of the landfill on the surrounding community. The survey showed that during the sampling period, the Oceanside Landfill had : 1) no significant environmental impact as measured by no incremental increase in pollutant levels on the surrounding air, water, and sediment; 2) no toxic pollutants measured in ambient air above levels generally considered significant or unsafe.

Also, a brief air quality screening survey was conducted at the Merrick Landfill in order to ascertain its environmental impact on its locale. No detectable impact was found upon the air quality of the areas immediately surrounding the Merrick Landfill during the sampling period.

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2. INTRODUCTION

An intensive survey consisting of a sampling and analysis effort was conducted at Oceanside Landfill, Oceanside, Long Island, New York during the period September 18 - October 19, 1983. The objective of this study was to provide an assessment of the environmental influence of the Oceanside Landfill on the surrounding area. During the course of this study, the task was expanded to include a brief air sampling effort at the Merrick Landfill in Merrick, Long Island, New York. The development and performance of this sampling project represented a multi-agency effort including personnel from the U.S. Environmental Protection Agency (U.S. EPA), the New York State Department of Environmental Conservation (NYSDEC), the Nassau County Department of Health (NCDOH), and the Town of Hempstead Department of Conservation & Waterways, and Department of Sanitation.

The U.S. EPA was responsible for sampling and analysis of air samples for all parameters considered during this phase of the project; sampling and analysis of water samples for all chemical parameters considered; and sampling and analysis performed by the TAGA 6000 tandem mass spectrometer. The NCDOH was responsible for sampling and analysis for vinyl chloride in air and bacteriological parameters in water samples. The Town of Hempstead provided on-site personnel support and a boat crew for water sampling. The State provided logistical support.

This study was designed to provide a comprehensive screening of the air quality, surface water quality, and sediment quality at, and adjacent to, the Oceanside Landfill. With respect to air quality, standard methods of collection and analysis were employed to sample for gaseous species. Organic vapors, vinyl chloride and aromatic amines generally associated with hazardous wastes were sampled for via National Institute of Occupational

Safety & Health-Physical & Chemical Analytical Methods (P & CAM) Methods. Vinyl chloride, was also sampled for via another method employed by NCDOH. The TAGA 6000, a mobile, computer controlled, tandem mass spectrometer system was utilized to provide rapid detection of most gaseous air species. The Organic Vapor Analyzer (OVA) was used to sample for total organic vapors and the methane fraction of organic vapors. The Photovac 10A10 was used to sample for organic and inorganic vapors in air. Beta and gamma radiation were sampled using a Victoreen Thyac III. The air quality phase of the study resulted in the sampling and analysis of a total of thirty-one locations at the Oceanside site.

Water samples for the Oceanside investigation (including surface water and leachate) were taken at sixteen locations; sediment samples were also obtained at these sixteen locations. Water samples were analyzed for priority pollutants, phenolics, and total organic carbon, and sediment samples were analyzed for priority pollutants (excluding volatile organics) and phenolics to provide for a complete screening of all forms of potential contaminants. All but one surface water station and all leachate stations were sampled for bacteria.

The sampling effort at the Merrick Landfill consisted of air quality screening which included the use of the TAGA 6000 unit, the OVA, and sampling for beta and gamma radiation. Seven locations were sampled. No water or sediment sampling was performed at the Merrick Landfill.

4. MERRICK LANDFILL STUDY

4.1 General

4.1.1 Background

The Merrick Landfill, located in Merrick, Long Island (see Figure 1) is also a municipal solid waste landfill operated by the Town of Hempstead, New York. It is 98 acres in size and has been in operation since the 1940's. The incinerators on site have not been in use since 1980. The landfill presently operates seven days a week, eight hours/day, although Saturday and Sunday are used only for household trash disposal. The landfill reportedly has received only residential solid waste since July 1983; prior to that time municipal solid waste was accepted. Closure of the landfill is expected in March, 1984.

4.1.2 Sampling Program

This study consisted of a brief screening of the air quality at Merrick Landfill. The effort was much reduced compared to the Oceanside Landfill study. A total of seven locations were sampled once with the TAGA 6000, the OVA operating in the survey mode, and the Victoreen Thyac III. The seven sites include a scanning background traverse, a downwind off-site location adjacent to the landfill, one downwind off-site location a distance from the landfill, and four on-site stations including a methane vent pipe, a leachate seep, and on the top of the mound. Sampling was conducted after the landfill was closed for the day and after the daily soil cover was applied, over the hours 1630 to 2000 on September 21.

4.1.3 Site Conditions During Sampling on 9/21/83

Sampling of Merrick Landfill started towards 1630 hrs., after sampling at Oceanside Landfill was completed. A change in the weather occurred as the sampling of Merrick Landfill was initiated. A light rain began to fall and was intermittant during the sampling. Temperatures dropped to 73-74°F and winds were from the south-southeast. Wind speeds were light; exact wind speeds were not recorded due to a malfunction in the portable weather station at this time.

4.2 Discussion of the Sampling

4.2.1 Sampling with the TAGA 6000

Sampling with this unit was conducted following the same basic priciples and methodology as described for the Oceanside study. It must be noted that the purpose of the Merrick effort was to provide a brief, yet adequate, screening of the air quality at Merrick.

Sampling with the TAGA 6000 took place at seven locations as described in Table 20 and located on Figures 11 and 12. Essentially two compounds were observed at amounts in excess of background. These compounds are ammonia and methanol. Ammonia was observed in the headspace samples taken at Site D (a leachate seep) and at Site E (a methane vent pipe). Methanol was not detected on-site; however, it was observed at Site F (1,000 ft. downwind or north of the landfill) and at Site G (2,500 ft. to the east of the landfill). Its presence in these samples cannot be definitively attributed to the landfill. Detection limits and ranges of concentration for these compounds are as described for the Oceanside Landfill study.

4.2.2 Organic Vapor Analyzer Sampling

Sampling with the Century Systems Model OVA-128 Organic Vapor Analyzer occurred concurrently with TAGA 6000 sampling at six of the seven sites sampled. Sampling was not conducted during the scanning background

TABLE 20
TAGA 6000 SAMPLING POINTS
AT MERRICK LANDFILL

		Ambient	Headspace
A.	Scanning background	X	
B.	Top of mound	X	
C.	Bottom of mound	X	
D.	Leachate seep in trench		X
E.	Methane well		X
F.	By landfill entrance gate (1000 ft. downwind)	X	
G.	Clubhouse Road near John Street	X	

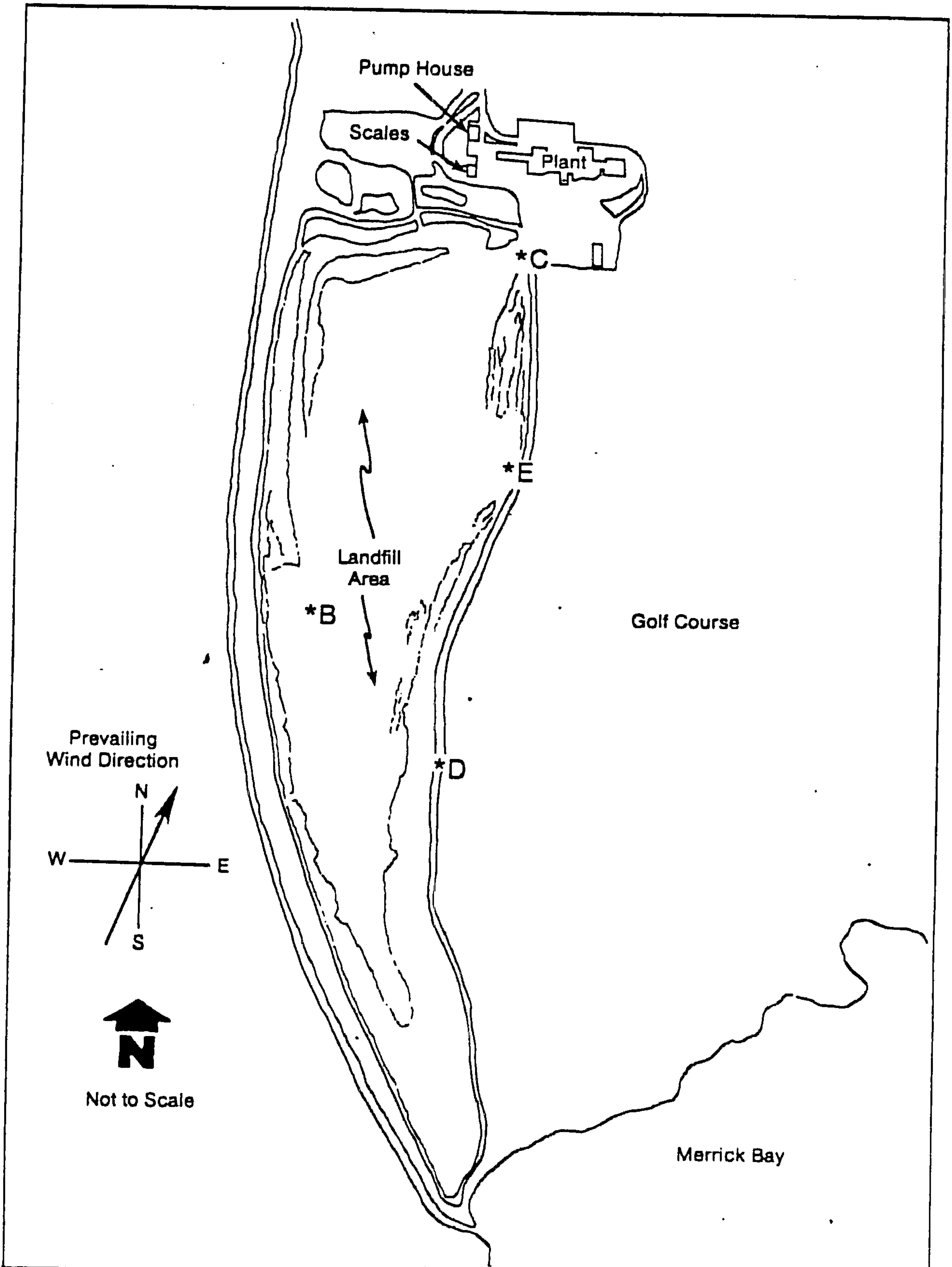

FIGURE 11 AIR SAMPLING SITES AT MERRICK LANDFILL

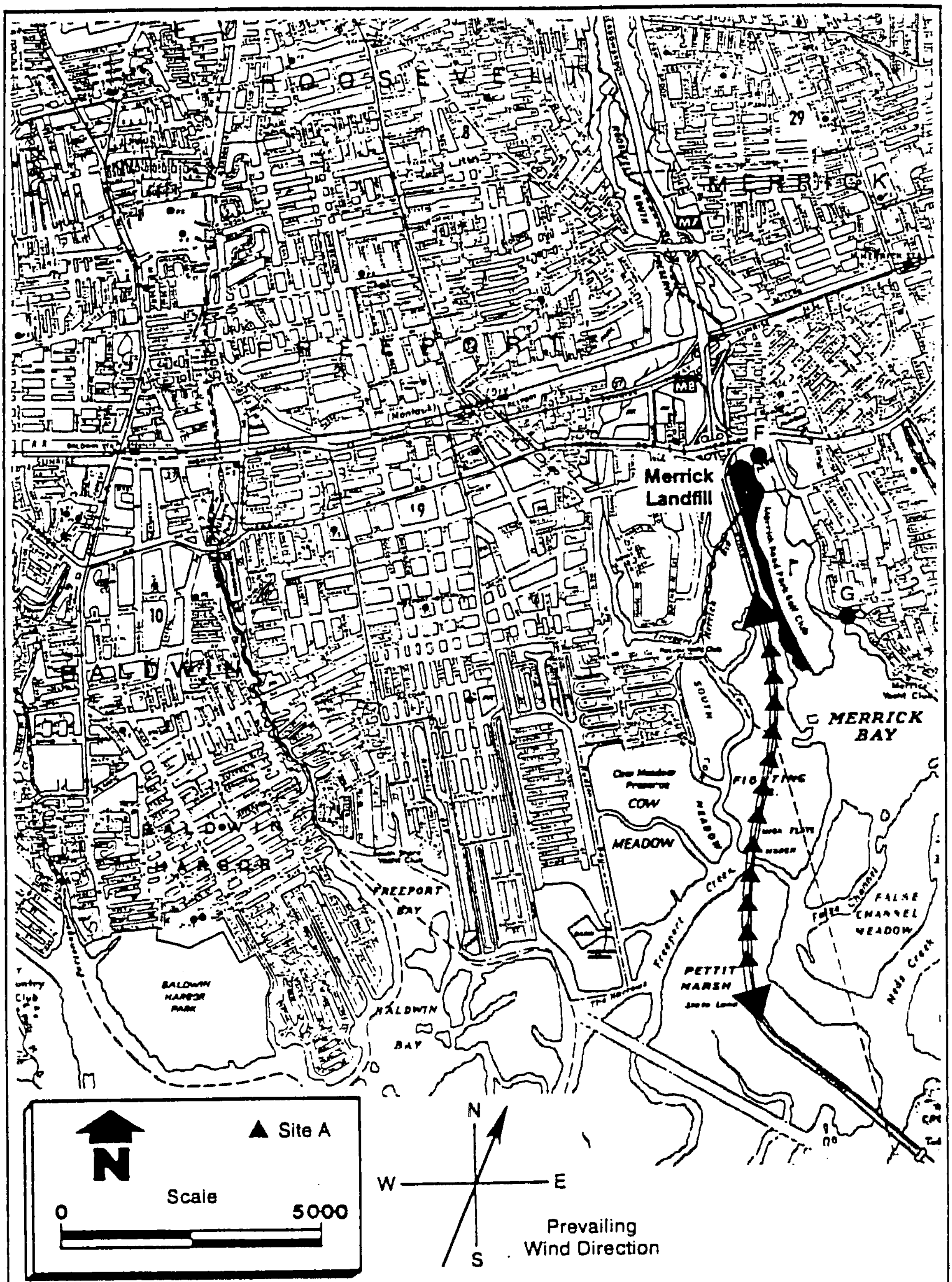

FIGURE 12 AIR SAMPLING SITES IN THE VICINITY OF MERRICK LANDFILL

traverse as the unit was in motion. The OVA was operated in the survey mode as described for the Oceanside Landfill study. Sampling results are shown in Table 21. The highest concentration was reported on the top of the landfill mound. Almost all of this reading was again due to the methane fraction of total organic vapors. Off-site locations including downwind showed typical background level readings and did not appear to be influenced by the landfill.

4.2.3 Victoreen Thyac III Sampling

Sampling with this unit for beta-gamma emissions occurred concurrently with the TAGA 6000 sampling at all sites with the exception of the mobile, scanning background traverse (Site A). At all locations, readings with the instrument were within the typical background levels of 0.01-0.02 mR/hr. At no time were these levels exceeded. No sources of radioactive contamination were detected during this survey.

4.3 Summary and Conclusions of the Merrick Study

Screening with the TAGA 6000 at Merrick, while basically similar to the Oceanside sampling methodology, focused primarily on the detection of chlorinated organics and aromatic compounds. Basically, the findings are similar to those for the Oceanside study. The compounds detected were not different than those found at the Oceanside Landfill, and are typical of municipal landfills. The data provided by the OVA were consistent with the TAGA 6000 data, and did not indicate any off-site influence of the landfill. In addition, no sources of radioactive contamination were found in this survey. In conclusion, no detectable impact was found upon the air quality in areas immediately adjacent to the Merrick Landfill during the sampling period.

TABLE 21
OVA SAMPLING RESULTS AT MERRICK LANDFILL

Sampling Location	Description	Sample Type	Concentration (ppm) [1] Total Organics	Methane Fraction
A	Scanning Background	Ambient	Not Sampled	Not Sampled
B	Top of landfill	Ambient	20	18
C	Bottom of landfill	Ambient	7-8	5
D	Over leachate seep	Headspace	5	5
E	Near methane vent	Ambient	5-6	5-6
F	Downwind, background, facility entrance	Ambient	3	2
G	Off site, on Clubhouse Road at John Street	Ambient	2	2

Notes: (1) Data have units of ppm of methane equivalent.

Sampling conducted on 9/21/83

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See file for more detailed information regarding significant Habitats and Reports. A topo map for each site is in the file and critical habitats are indicated.

1/3/84
LEW

Significant Habitats - Phase 1 Reports

REFERENCE: NYSDEC, 1984, Significant Habitat Reports and Maps in (applicable) County, Division of Fish and Wildlife, Significant Habitats Unit.

Nassau
Suffolk
Kings
Albany
Rensselaer

Site Number	Report
1	None
2	30-20 Island Park
	-23 Cinder Island; No. Cinder Island; Gull Island
	-29 East Channel Island - subcolony 1 and 2; Garrett Marsh
	-30 Pearsalls Hassock
3	52-35 - Manorville Hills* (just outside 1 mile radius - check map)
	37 - Rock Hill - Radar Hill Pine Barrens
* 4 Merrick L.F.	None
5	None
6	52-16 - Port Jefferson Harbor
7	None
8	None
9	52-1 Great South Bay

Site Number	Report
10	None
11	None
12	None
13	None
14	None
15	None
16	None
17	None
18	52-58 North Sea Harbor
19	None
20	None
21	None
22	None
23	None
24	42-1 Hoosic River & Associated Lowlands

Proximity of Active Agricultural Land and Prime Farmland to Candidate Inactive Hazardous Waste Sites

Site 4 Herrick Landfill, no agricultural lands Source NYSDAM

Site No.	Sheet No.	Criteria #1*	Criteria #2**	Comments
1	57 ≠	No	Yes	Prime farmland within 2 but not 1 mile
3	70 ≠	Yes	Yes	Prime farmland within 3/4 mile
5	8 & 17 ≠	Yes	Yes	Active prime farmland in Suffolk County Agricultural District #1 adjacent to site
6	40 ≠	No	No?	Mount Sinai area to N/E (Sheet 40) and area to east should be investigated - farmland is at the 2 mile range
8	64 & 65 ≠	No	No	
12	54 ≠	Yes	Yes	Nursery stock 700 ft. south; 40 acre vegetable farm is SW about 1.5 miles; within mile to the north
16	51 ≠	Yes	Yes	30 acre vegetable farm to the west; areas to the east
17	17 ≠	Yes	Yes	All farmland prime; horse farm adjacent to site to the west; also farmland within 3/4 mile to the North and Northeast
18	47 ≠	Yes	Yes	Prime farmland within 1.5 miles; vegetable farm within a mile at North Sea
23	≠	Yes	Yes	Active agricultural land within 1/4 mile, active prime farmland within 1/2 mile - site is adjacent to Rensselaer County Agricultural District #7
24	≠	Yes	Yes	Active prime farmland within 1/4 mile; site is adjacent to Rensselaer County Agricultural District #3.

*Distance to agricultural land in production within past 5 years, if 1 mile or less.

**Distance to prime agricultural land in production within past 5 years, if 2 miles or less.

≠ Soil survey of Suffolk County, USDA-SCS in cooperation with Cornell Agricultural Experiment Station issued 4/75--information obtained during telephone conversations with Suffolk County SWCD, and County USDA, Agricultural Stabilization and Conservation Service staff.

≠ - Not Applicable; soil survey mapping completed-awaiting publication--information obtained during telephone conversation with the USDA-SCS, District Conservationist with the Rensselaer County SWCD.

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January 1985

WOODWARD-CLYDE CONSULTANTS
WASTE SITE INSPECTION REPORT

Name of Site: MERRICK LAND FILL County: NASSAU
Address: 1600 MERRICK RD.

Inspector: DAVID MUSCALO Time and Date of Inspection: 8:00 AM 1/3/84
Weather Conditions: PARTLY CLOUDY - COLD

I. SITE DESCRIPTION

1. Type of Site:

✓ A Surface Impoundment INACTIVE LAGOONS REHABILLITATED
___ B Piles
✓ C Drums Above Ground one
___ D Tank Above Ground
___ E Tank Below Ground
✓ F Landfill
___ G Landfarm
___ H Open Dump
___ I Other

2. Buildings on Site? yes/no
If yes, describe:
INCINERTOR BLDG
GARAGE
SHOP
TRANSFER STATION
ADMINISTRATION BLDG
SMALL MAINTENANCE
MACHINE GARAGE

3. Area of Site: 88 ACRES

General Description:

II. INTERVIEW RECORD

1. Name(s): MR. JAMES HEIL
   MR. ADOLPH ALBANESE
2. Position(s): COMMISSIONER OF SANITATION
   DEPUTY COMMISSIONER OF SANITATION
3. Telephone Number: (516) 378-4210

4. Name of Current Owner of Site: TOWN OF HEMPSTEAD

5. Address of Current Owner of Site: TOWN HALL PLAZA MAIN ST. HEMPSTEAD N.Y. ~~11566~~ 11550

6. Time Period Site Was Used for Hazardous Waste Disposal:

, 1950 To , 1984

Is site Active Inactive at present?

Past Sampling Activities: Air Ground Water None
Surface Water Soil

Remedial Action: Proposed Under Design
~~In Progress~~ Completed

Status of Legal Action: State Federal

Permits Issued: Federal Local Government ~~SPDES~~
Solid Waste Mined Land Wetlands Other

II. INTERVIEW RECORD (continued)

Waste Characteristics:

garbage 78%
rubbish 14.5% (commercial waste)
demolition (negligible
debris
street sweeping 1.5%
Landscaping 6.0%
incinerator ash
~~volume~~
volume circa 1984 3,800,000 yds^3
1,900,000 Tons

Other Information: (site history, operator information, generator/transporter information, past response activities, legal actions, hazardous incidents, other information). originally wetlands

1/3/85

1/3/85

III. SURFACE WATER

1. Is there identifiable leachate? yes/no
   If yes, describe:
   Described as tested in Weston's "Merrick Landfill Study" 1984 from analyses with OVA & Victoreen & Thyac

2. Is site competely surrounded by higher ground:
   yes/no/uncertain from field observations

3. Appropriate distance to nearest observed downgradient body of.
   Surface water: several feet from Merrick Bay
   Description: estuary
   Use: recreation - ocean access

4. Average slope of site: 3% TOP OF L.F. 5-8%
   3-5% >8% SIDES OF L.F.

5. On site ponding? yes/no
   If yes, describe: small puddles on top of l.f.

6. Average slope of terraine between site and nearest observed down slope surface water body: 3% 5-8%
   3-5% 8%

7. In an area of flood plain? yes/no

III. SURFACE WATER (continued)

8. Damage to floral fauna from surface water? yes/no
If yes, describe:

9. Surface Features (general topography, paving, structures, etc.):
area surrounding landfill is flat-lying - landfill rises 80 to 125 ft above surrounding land

IV. GROUND WATER

1. On site wells? yes/none observed

   If yes:

   number 4 , 12 methane monitoring wells

   location

   description water wells

2. Observations concerning ground water none

3. Observations concerning stratigraphy

   sand and gravel ~~only~~ underlie site

4. Damage to flora/fauna from ground water? yes/no

   If yes, describe.

V. AIR

1. Evidence of air contaminants emitted from site:

OVA readings to 300 ppm from suspected leachate
HNU " <1 ppm
indicates presence of methane gas
OVA reading in Johnson's wax drum 300ppm

2. Rationale for attributing the contaminants to the site:

presence drum with high OVA readings

VI. DEMOGRAPHY/LAND USE

1. Distance to nearest observed off-site building 250 Gulf Course Maintenance Building
2. Distance to nearest observed residence 1800 ft
3. Estimated number of households within a radius of 1/4 mile 11
4. Distance to nearest observed commercial/industrial land use 3,600 ft
   Description: Town sign shop & town purchasing dept.
5. Distance to nearest observed agricultural lands < ten miles
   Description:

6. Observed historic landmark sites? yes/no
   If yes, describe, give approximate distance:

7. Observed park/open space area? yes/no
   If yes, describe, give approximate distance:
   gulf course adjacent to east side
   tennis courts and baseball diamonds 1,200 ft

8. Observed wetlands or low-lying area? yes/no
   If yes, describe, give approximate distance and area in acres:
   adjacent to site on east, west & south sides

9. Observed critical habitat or wildlife refuge? yes/no
   If yes, describe, give approximate distance: 40 < mile

10. General description of use of adjacent lands.
   commercial, industrial, recreation and residential

VII. WASTE CHARACTERISTICS

1. Physical State of Waste — Comments
   - ~~NA~~ solid, stable
   - ✓ solid, unstable
   - ____ powder, fines
   - ____ sludge
   - ____ slurry
   - ____ liquid
   - ____ gas
   - ____ other

2. Estimated quantity of waste: 3,000,000 YDS.^{3}

3. Estimated quantity of waste that appears fully contained: none

4. Odors? yes/no
   If yes, describe: garbage odor

5. Observations concerning suspected waste materials
   1 drums with high OVA readings to 300 ppm

VIII. WASTE CONTAINMENT

1. Observed soil/rock material underlying site:
   sand + gravel

   natural/artificial/unknown   permeability: low/moderate/high

2. Diversion system? yes/no
   Description/condition:

3. Leachate collection system?. yes/no
   Description/condition:

4. Is there diking? yes/no; If yes, is it sound/unsound?

5. If diking exists, does it have adequate freeboard? yes/no

6 If site has containers (i.e., 55-gallon drums): are they sealed and in sound condition or leaking? historically

7. If waste is in piles, no
   a. Are piles ~~covered/uncovered?~~ ~~one large pile~~
   b. Is waste ~~stabilized/unstabilized?~~

8. If waste is in a landfill:
   a. Is there potential for ponding on surface of landfill? yes
   b. Is there potential for erosion? yes
   c. Is there refuse visible at surface? yes
   d. If covered, is the cover seeded/vegetational cover? partially

VIII. WASTE CONTAINMENT (continued)

9. Damage to flora/fauna from direct contact? yes/no

If yes, describe:

10. Security

- 24-hour surveillance
- security guard
- complete barrier
- incomplete barrier land portion not water portion
- no barriers
- controlled entry
- signs posted

11. Comments concerning waste containment:

waste is fairly well covered but some ~~protrude~~ protrudes from sides and through top of l. f.

IX. SITE INVESTIGATION FEASIBILITY

1. Accessible to vehicles? yes/no
   If no, why:

2. Accessible to drill rig? yes/no
   If no, why:

3. Nearest drilling water source: hydrant on site

4. Accessible to backhoe: yes/no
   If no, why

5. Geophysical Surveys:
   Accessible: yes/no
   Overhead interference none
   Surface interference probably
   Subsurface interference probably

6. Accessibility of adjacent off-site lands: good

7. Comments none

00-00-103 (6/78)

RECEIVED

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New York State Department of Environmental Conservation

MEMORANDUM

BUREAU ... CONTROL
... HAZARDOUS WASTE

TO: Tracey Toffelmire
FROM: John Conover 516 751 7900 x221
SUBJECT: Public water supply wells North of merrick landfill
DATE: 2/19/86

Attached - List of wells & maps of location

A- Village of Freeport 4,000' NNW of Merrick Cr
wells

Conover, 1986 page 2 of 3

N - 5696	521'	MAGOTHY
N 131		M
N 132		M
N 133		M
N 134		M
N 7796		M

NY Water Service 5,500' NNE of
Massapequa - Merrick Merrick Cr

~~Uniondale Wat. Dept~~

Glacial Aquifer

N 3187	G	standby
2577	G	
3437	G	
634	G	
3186	G	
7407	M	Magothy
8253	M	

MERRICK — Conover, 1986 page 3 of 3

Appendix C

HAZARDOUS WASTE DISPOSAL SITES REPORT
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Code: ______

Site Code: 130022

Name of Site: Merrick Landfill   Region: 1

County: Nassau   Town/City Merrick

Street Address 1600 Merrick Road

Status of Site Narrative:

The site is an inactive landfill which had accepted municipal solid waste since 1950 and was closed in 1984. There is no direct evidence of hazardous materials having been dumped on the site.

Type of Site: Open Dump [ ]   Treatment Pond(s) [ ]   Number of Ponds ______
Landfill [X]   Lagoon(s) [X]   Number of Lagoons 3
Structure [ ]

Estimated Size 82 Acres

Hazardous Wastes Disposed? Confirmed [ ]   Suspected [X]

*Type and Quantity of Hazardous Wastes:

TYPE	QUANTITY (Pounds, drums, tons, gallons)
Ammonia detected in leachate	
Heavy metals in incinerator outfall	unknown
Mixed municipal refuse.	

* Use additional sheets if more space is needed.

Name of Current Owner of Site: Town of Hempstead, Division of Sanitation

Address of Current Owner of Site: Town Hall Plaza, Main Street

Time Period Site Was Used for Hazardous Waste Disposal:

, 1950 To Present , 19

Is site Active ☐ Inactive ☒
(Site is inactive if hazardous wastes were disposed of at this site and site was closed prior to August 25, 1979)

Types of Samples: Air ☒ Groundwater ☐ None ☐
Surface Water ☐ Soil ☐

Remedial Action: Proposed ☒ Under Design ☐
In Progress ☐ Completed ☐
Nature of Action: Capping-closure

Status of Legal Action: Consent Order State ☒ Federal ☐

Permits Issued: Federal ☐ Local Government ☐ SPDES ☒ applied for, 1979
Solid Waste ☐ Mined Land ☐ Wetlands ☐ Other ☐

Assessment of Environmental Problems:

The potential exists for contamination of air and surface water. A preliminary screening of air quality detected methanol and ammonia both on and off-site in the ambient air and in leachate headspace. Although the lagoons have since been rehabilitated, for years the outflow from the incinerator had been discharging heavy metals into East Bay. Since the shallow water table is not used for drinking water in the area and the hydraulic connection, with the deeper Magothy formation is restricted by the confining clay layers, ground water contamination is a lesser concern.

Assessment of Health Problems:

There are not enough data for an assessment of health problems. Preliminary screening of air quality suggests off-site migration of air contaminants including methane, methanol and ammonia.

Persons Completing this Form:

Michael Akerbergs - Woodward-Clyde Consultants, Inc.

New York State Department of Environmental Conservation

Date February 26, 1985

New York State Department of Health

6/3/81
RPM:cl